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KCET 2019 Question Paper with Solution

The Karnataka Common Entrance Test

ಸಾಮಾನ್ಯ ಪ್ರವೇಶ ಪರೀಕ್ಷೆ-2019

ದಿನಾಂಕ	ವಿಷಯ	ಸಮಯ	ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ	
			ವರ್ಷನ್ ಕೋಡ್	ಕ್ರಮ ಸಂಖ್ಯೆ
30-04-2019	ಭೌತಶಾಸ್ತ್ರ	ಬೆ. 10.30 ರಿಂದ 11.50 ರವರೆಗೆ	C-3	537191

ಒಟ್ಟು ಅವಧಿ	ಉತ್ತರಿಸಲು ಇರುವ ಗರಿಷ್ಠ ಅವಧಿ	ಗರಿಷ್ಠ ಅಂಕಗಳು	ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳು	ನಿಮ್ಮ ಸೀಟಿ ಸಂಖ್ಯೆಯನ್ನು ಬರೆಯಿರಿ
80 ನಿಮಿಷಗಳು	70 ನಿಮಿಷಗಳು	60	60	C T 3 5 2

ಮಾಡಿ

1. ಓ.ಎಂಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮತ್ತು ಪ್ರವೇಶ ಪತ್ರವಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಸೀಟಿ ಸಂಖ್ಯೆ ಮತ್ತು ಹೆಸರು ಒಂದೇ ಆಗಿದೆಯೆ ಎಂದು ಮತ್ತೊಮ್ಮೆ ದೃಢೀಕರಿಸಿಕೊಳ್ಳಿ. ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ತಿಳಿಸಿ.
2. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಂದ ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ನಿಮಗೆ 2ನೇ ಬೆಲ್ ಆದ ನಂತರ, ಅಂದರೆ ಬೆ. 10.30 ಆದ ನಂತರ ಕೊಡಲಾಗುವುದು.
3. ನಿಮಗೆ ನೀಡಿರುವ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಒಂದೇ ಆಗಿರುವುದನ್ನು ಖಾತ್ರಿಪಡಿಸಿಕೊಳ್ಳಿ. ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ತಿಳಿಸಿ.
4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಮತ್ತು ಕ್ರಮ ಸಂಖ್ಯೆಯನ್ನು ನಾಮಿನಲ್ ರೋಲ್‌ನಲ್ಲಿ ತಪ್ಪಿಲ್ಲದೆ ಬರೆಯಬೇಕು.
5. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ಕೆಳಭಾಗದ ನಗದಿತ ಜಾಗದಲ್ಲಿ ಪೂರ್ಣ ಸಹಿ ಮಾಡಬೇಕು.

ಮಾಡಬೇಡಿ

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಟೈಮಿಂಗ್ ಮಾರ್ಕ್‌ನ್ನು ತಿದ್ದಬಾರದು / ಹಾಳುಮಾಡಬಾರದು / ಅಳಸಬಾರದು.
2. ಮೂರನೇ ಬೆಲ್ ಬೆ. 10.40 ಕ್ಕೆ ಆಗುತ್ತದೆ. ಅಲ್ಲಿಯವರೆಗೂ,
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ಅನ್ನು ತೆಗೆಯಬಾರದು.
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಒಳಗಡೆ ಇರುವ ಪ್ರಶ್ನೆಗಳನ್ನು ನೋಡಲು ಪ್ರಯತ್ನಿಸಬಾರದು ಅಥವಾ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸಬಾರದು.

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಮುಖ್ಯ ಸೂಚನೆಗಳು

1. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒಟ್ಟು 60 ಪ್ರಶ್ನೆಗಳಿದ್ದು, ಪ್ರತಿ ಪ್ರಶ್ನೆಗೂ 4 ಬಹು ಆಯ್ಕೆ ಉತ್ತರಗಳು ಇರುತ್ತವೆ.
2. ಮೂರನೇ ಬೆಲ್ ಅಂದರೆ ಬೆ. 10.40ರ ನಂತರ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ತೆಗೆದು ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯಾವುದೇ ಪುಟಗಳು ಮುದ್ರಿತವಾಗಿಲ್ಲದೇ ಇರುವುದು ಕಂಡು ಬಂದಲ್ಲಿ ಅಥವಾ ಹರಿದು ಹೋಗಿದ್ದಲ್ಲಿ ಅಥವಾ ಯಾವುದೇ ಐಟಂಗಳು ಬಿಟ್ಟುಹೋಗಿದೆಯೇ ಎಂಬುದನ್ನು ಖಚಿತಪಡಿಸಿಕೊಂಡು, ಈ ರೀತಿ ಆಗಿದ್ದರೆ ಕೂಡಲೇ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಂದ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಿಕೊಳ್ಳಿ ನಂತರ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸುವುದು.
3. ಮುಂದಿನ 70 ನಿಮಿಷಗಳಲ್ಲಿ
   - ಪ್ರತಿ ಪ್ರಶ್ನೆಯನ್ನು ಎಚ್ಚರಿಕೆಯಿಂದ ಓದಿ.
   - ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ಕೊಟ್ಟಿರುವ ನಾಲ್ಕು ಬಹು ಆಯ್ಕೆಯ ಉತ್ತರಗಳಲ್ಲಿ ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ. ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ಉತ್ತರಗಳು ನಿಮ್ಮ ಗಮನಕ್ಕೆ ಬಂದರೂ ನಿಮಗೆ ಅತಿಉತ್ತಮವೆನಿಸಿದ ಒಂದನ್ನೇ ಆರಿಸುವುದು.
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗೆ ಅನುಗುಣವಾಗಿರುವ ಸರಿ ಉತ್ತರವನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಅದೇ ಕ್ರಮ ಸಂಖ್ಯೆಯ ಮುಂದೆ ನೀಡಿರುವ ಸಂಬಂಧಿಸಿದ ವೃತ್ತವನ್ನು **ನೀಲಿ ಅಥವಾ ಕಪ್ಪು** ಶಾಯಿಯ ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್‌ನಿಂದ ಸಂಪೂರ್ಣ ತುಂಬುವುದು.

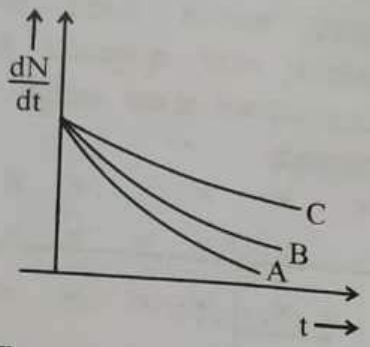
ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
(A) ● (C) (D)	✓ (B) (C) (D) (A) (B) (C) ✓ (D) (A) ● ● (D)
	● (B) (C) (D) (A) ● (C) (D)

4. ಈ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಸ್ಕ್ಯಾನ್ ಮಾಡುವ ಸ್ಕ್ಯಾನರ್ ಬಹಳ ಸೂಕ್ಷ್ಮವಾಗಿದ್ದು ಸಣ್ಣ ಗುರುತನ್ನು ಸಹ ದಾಖಲಿಸುತ್ತದೆ. ಆದ್ದರಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸುವಾಗ ಎಚ್ಚರಿಕೆ ವಹಿಸಿ.
5. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಕೊಟ್ಟಿರುವ ಖಾಲಿ ಜಾಗವನ್ನು ರಫ್ ಕೆಲಸಕ್ಕೆ ಉಪಯೋಗಿಸಿ. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಇದಕ್ಕೆ ಉಪಯೋಗಿಸಬೇಡಿ.
6. ಕೊನೆಯ ಬೆಲ್ ಅಂದರೆ ಬೆ. **11.50** ಆದ ನಂತರ ಉತ್ತರಿಸುವುದನ್ನು ನಿಲ್ಲಿಸಿ. ನಿಮ್ಮ ಎಡಗೈ ಹೆಬ್ಬರಳ ಗುರುತನ್ನು ನಿಗದಿತ ಜಾಗದಲ್ಲಿ ಹಾಕಿ.
7. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಯಥಾಸ್ಥಿತಿಯಲ್ಲಿ ನೀಡಿರಿ.
8. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ಮೇಲ್ಭಾಗದ ಹಾಳೆಯನ್ನು ಪ್ರತ್ಯೇಕಿಸಿ (ಕೆಇಎ ಪ್ರತಿ) ತನ್ನ ವಶದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡು ತಳಬದಿಯ ಯಥಾಪ್ರತಿಯನ್ನು (Candidate's Copy) ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸ್ವಯಂ ಮೌಲ್ಯಮಾಪನಕ್ಕಾಗಿ ಮನೆಗೆ ಕೊಂಡೊಯ್ಯಲು ಕೊಡುತ್ತಾರೆ.
9. ಉತ್ತರ ಪತ್ರಿಕೆಯ ನಕಲನ್ನು ಒಂದು ವರ್ಷ ಕಾಲ ಸುರಕ್ಷಿತವಾಗಿ ಇಡಿ.

ಸೂಚನೆ: ಕನ್ನಡ ಆವೃತ್ತಿಯ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ ಉತ್ತರಿಸುವ ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಕನ್ನಡದಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಪ್ರಶ್ನೆಗಳ ಬಗ್ಗೆ ಏನಾದರೂ ಸಂದೇಹವಿದ್ದಲ್ಲಿ ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಯ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ನೋಡಬಹುದು. ಏನಾದರೂ ವ್ಯತ್ಯಾಸ ಕಂಡುಬಂದಲ್ಲಿ ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಯನ್ನು ಅಂತಿಮ ಎಂದು ಪರಿಗಣಿಸಲಾಗುವುದು

P C-3

1. Which one of the following nuclei has shorter mean life ?



(A) B

(B) Same for all

(C) A

(D) C

2. The conductivity of semiconductor increases with increase in temperature because

(A) relaxation time increases

(B) number density of current carriers increases, relaxation time decreases but effect of decrease in relaxation time is much less than increase in number density

(C) number density of charge carriers increases

(D) both number density of charge carriers and relaxation time increase

3. For a transistor amplifier, the voltage gain

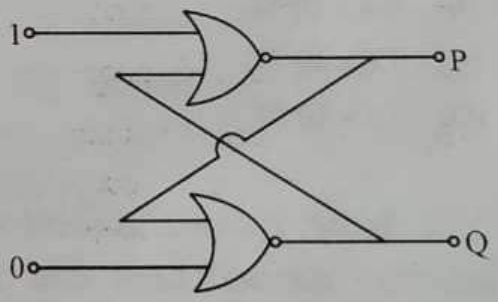
(A) is high at high and low frequencies and constant in the middle frequency range

(B) constant at high frequencies and low at low frequencies

(C) remains constant for all frequencies

(D) is low at high and low frequencies and constant at mid frequencies

4. In the following circuit, what are P and Q ?



(A) P = 1, Q = 0

(B) P = 1, Q = 1

(C) P = 0, Q = 0

(D) P = 0, Q = 1

Space For Rough Work

5. An antenna uses electromagnetic waves of frequency 5 MHz. For proper working, the size of the antenna should be

(A) 300 m

(B) 3 km

(C) 15 m

(D) 15 km

6. A magnetic needle has a magnetic moment of 5×10^{-2} Am^2 and moment of inertia 8×10^{-6} kgm^2. It has a period of oscillation of 2s in a magnetic field $\vec{B}$. The magnitude of magnetic field is approximately

(A) $0.4 \times 10^{-4}T$

(B) $0.8 \times 10^{-4}T$

(C) $1.6 \times 10^{-4}T$

(D) $3.2 \times 10^{-4}T$

7. A toroid has 500 turns per metre length. If it carries a current of 2A, the magnetic energy density inside the toroid is

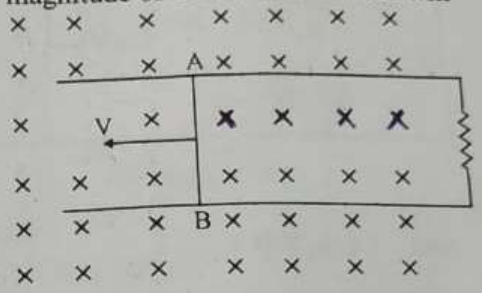
(A) 0.314 J/m^3

(B) 3.14 J/m^3

(C) 0.628 J/m^3

(D) 6.28 J/m^3

8. Consider the situation given in figure. The wire AB is slid on the fixed rails with a constant velocity. If the wire AB is replaced by a semicircular wire, the magnitude of the induced current will



(A) remain same

(B) increase or decrease depending on whether the semicircle bulges towards the resistance or away from it

(C) increase

(D) decrease

9. The frequency of an alternating current is 50 Hz. What is the minimum time taken by current to reach its peak value from rms value ?

(A) 2.5×10^{-3}s

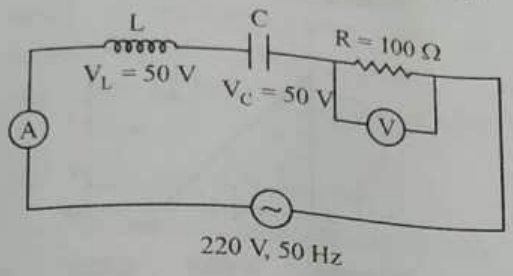
(B) 10×10^{-3}s

(C) 5×10^{-3}s

(D) 0.02s

Space For Rough Work

10. The readings of ammeter and voltmeter in the following circuit are respectively



(A) 1.5 A, 100 V

(B) 2.2 A, 220 V

(C) 1.2 A, 120 V

(D) 2.7 A, 220 V

11. Two metal plates are separated by 2 cm. The potentials of the plates are – 10 V and + 30 V. The electric field between the two plates is

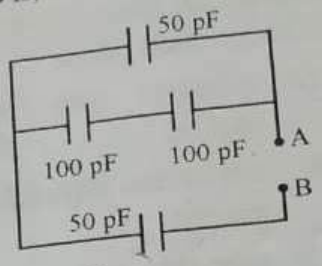
(A) 1000 V/m

(B) 3000 V/m

(C) 500 V/m

(D) 2000 V/m

12. The equivalent capacitance between A and B is.



(A) $\frac{100}{3}$ pF

(B) 300 pF

(C) 50 pF

(D) 150 pF

13. A capacitor of capacitance C charged by an amount Q is connected in parallel with an uncharged capacitor of capacitance 2C. The final charges on the capacitors are

(A) $\frac{Q}{4}, \frac{3Q}{4}$

(B) $\frac{Q}{5}, \frac{4Q}{5}$

(C) $\frac{Q}{2}, \frac{Q}{2}$

(D) $\frac{Q}{3}, \frac{2Q}{3}$

Space For Rough Work

14. Though the electron drift velocity is small and electron charge is very small, a conductor can carry an appreciably large current because

(A) drift velocity of electron is very large

(B) relaxation time is small

(C) electron number density is very large

(D) electron number density depends on temperature

15. Masses of three wires of copper are in the ratio 1:3:5 and their lengths are in the ratio 5:3:1. The ratio of their electrical resistance are

(A) 5:3:1

(B) 125:15:1

(C) 1:3:5

(D) 1:15:125

16. If P, Q and R are physical quantities having different dimensions, which of the following combinations can never be a meaningful quantity ?

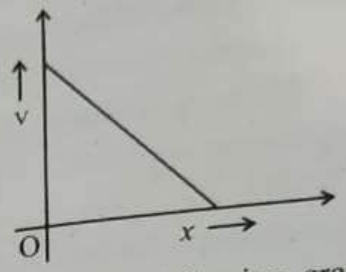
(A) $PQ - R$

(B) $\frac{PR - Q^2}{R}$

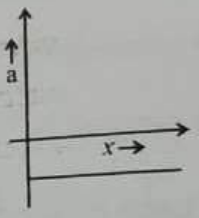
(C) $\frac{P - Q}{R}$

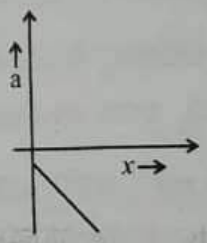
(D) $\frac{PQ}{R}$

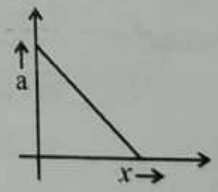
17. The given graph shows the variation of velocity (v) with position (x) for a particle moving along a straight line

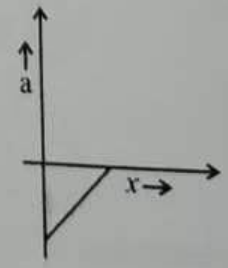


Which of the following graph shows the variation of acceleration (a) with position (x) ?

(A)


(B)


(C)


(D)


Space For Rough Work

18. The trajectory of a projectile projected from origin is given by the equation $y = x - \frac{2x^2}{5}$. The initial velocity of the projectile is

(A) $5\ ms^{-1}$

(B) $\frac{5}{2} ms^{-1}$

(C) $\frac{2}{5} ms^{-1}$

(D) $25\ ms^{-1}$

19. An object with mass 5 kg is acted upon by a force, $\vec{F} = (-3\hat{i} + 4\hat{j})$ N. If its initial velocity at t = 0 is $\vec{v} = (6\hat{i} - 12\hat{j})\ ms^{-1}$, the time at which it will just have a velocity along y-axis is

(A) 10 s

(B) 15 s

(C) 5 s

(D) 2 s

20. During inelastic collision between two objects, which of the following quantity always remains conserved ?

(A) Total mechanical energy

(B) Speed of each body

(C) Total kinetic energy

(D) Total linear momentum

21. In Rutherford experiment, for head-on collision of α-particles with a gold nucleus, the impact parameter is

(A) of the order of 10^{-14} m

(B) of the order of 10^{-6} m

(C) zero

(D) of the order of 10^{-10} m

22. Frequency of revolution of an electron revolving in n^{th} orbit of H-atom is proportional to

(A) n

(B) $\frac{1}{n^3}$

(C) $\frac{1}{n^2}$

(D) n independent of n

Space For Rough Work

23. A hydrogen atom in ground state absorbs 10.2 eV of energy. The orbital angular momentum of the electron is increased by

(A) 2.11×10^{-34} Js

(B) 4.22×10^{-34} Js

(C) 1.05×10^{-34} Js

(D) 3.16×10^{-34} Js

24. The end product of decay of $_{90}Th^{232}$ is $_{82}Pb^{208}$. The number of α and β particles emitted are respectively

(A) 6, 4

(B) 4, 6

(C) 3, 3

(D) 6, 0

25. Two protons are kept at a separation of 10 nm. Let F_n and F_e be the nuclear force and the electromagnetic force between them

(A) $F_e \gg F_n$

(B) F_e and F_n differ only slightly

(C) $F_e = F_n$

(D) $F_e \ll F_n$

26. Two particles which are initially at rest move towards each other under the action of their mutual attraction. If their speeds are v and 2v at any instant, then the speed of center of mass of the system is,

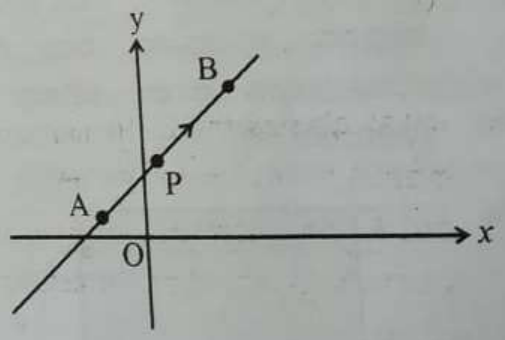
(A) Zero

(B) v

(C) 2v

(D) 1.5 v

27. A particle is moving uniformly along a straight line as shown in the figure. During the motion of the particle from A to B , the angular momentum of the particle about 'O'



(A) decreases

(B) first increases then decreases

(C) increases

(D) remains constant

Space For Rough Work

28. A satellite is orbiting close to the earth and has a kinetic energy K. The minimum extra kinetic energy required by it to just overcome the gravitation pull of the earth is

(A) 2K

(B) $2\sqrt{2}K$

(C) K

(D) $\sqrt{3}K$

29. A wire is stretched such that its volume remains constant. The Poission's ratio of the material of the wire is

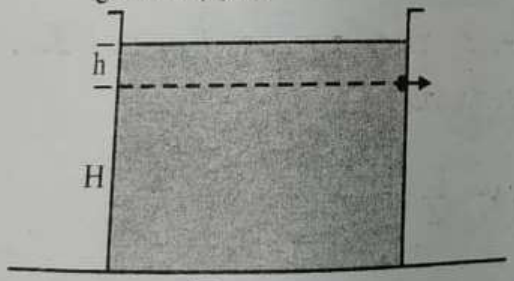
(A) –0.50

(B) –0.25

(C) 0.50

(D) 0.25

30. A cylindrical container containing water has a small hole at height of H = 8 cm from the bottom and at a depth of 2 cm from the top surface of the liquid. The maximum horizontal distance travelled by the water before it hits the ground (x) is



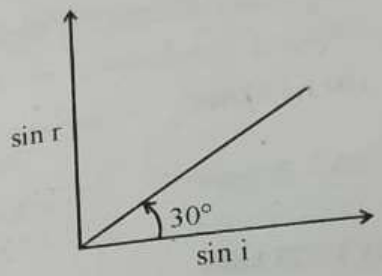
(A) $4\sqrt{2}$ cm

(B) 6 cm

(C) 8 cm

(D) 4 cm

31. A transparent medium shows relation between i and r as shown. If the speed of light in vacuum is c the Brewster angle for the medium is



(A) 45°

(B) 90°

(C) 30°

(D) 60°

32. In Young's double slit experiment, using monochromatic light of wavelength λ, the intensity of light at a point on the screen where path difference is λ is K units. The intensity of light at a point where path difference is $\frac{\lambda}{3}$ is

(A) $\frac{K}{4}$

(B) 2K

(C) K

(D) 4K

Space For Rough Work

33. Due to Doppler's effect the shift in wavelength observed is 0.1 Å for a star producing wavelength 6000 Å. Velocity of recession of the star will be

(A) 10 km/s

(B) 20 km/s

(C) 25 km/s

(D) 5 km/s

34. An electron is moving with an initial velocity $\vec{V} = V_0\hat{i}$ and is in a uniform magnetic field $\vec{B} = B_0\hat{j}$. Then its de Broglie wavelength

(A) increases with time

(B) increase and decreases periodically

(C) remains constant

(D) decreases with time

35. Light of certain frequency and intensity incident on a photosensitive material causes photoelectric effect. If both the frequency and intensity are doubled, the photoelectric saturation current becomes

(A) doubled

(B) unchanged

(C) quadrupled

(D) halved

36. A certain charge 2Q is divided at first into two parts q_1 and q_2. Later the charges are placed at a certain distance. If the force of interaction between two charges is maximum then $\frac{Q}{q_1} =$ _____.

(A) 2

(B) 0.5

(C) 4

(D) 1

Space For Rough Work

37. A particle of mass m and charge q is placed at rest in uniform electric field E and then released. The kinetic energy attained by the particle after moving a distance y is

(A) qE^2y

(B) q^2Ey

(C) qEy^2

(D) qEy

38. An electric dipole is kept in non-uniform electric field. It generally experiences

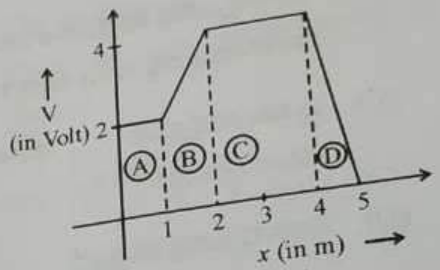
(A) A force but not a torque

(B) Neither a force nor a torque

(C) A force and torque

(D) A torque but not a force

39. The figure gives the electric potential V as a function of distance through four regions on x-axis. Which of the following is true for the magnitude of the electric field E in these regions ?



(A) $E_A = E_C$ and $E_B < E_D$

(B) $E_A < E_B < E_C < E_D$

(C) $E_A > E_B > E_C > E_D$

(D) $E_B = E_D$ and $E_A < E_C$

40. A system of two charges separated by a certain distance apart stores electrical potential energy. If the distance between them is increased, the potential energy of the system,

(A) decreases in any case

(B) remains the same

(C) increases in any case

(D) may increase or decrease

Space For Rough Work

41. In a cyclotron a charged particle

(A) speeds up between the dees because of the magnetic field.

(B) slows down within a dee and speeds up between dees

(C) undergoes acceleration all the time

(D) speeds up in dee

42. The number of turns in a coil of Galvanometer is tripled, then

(A) Voltage sensitivity remains constant and current sensitivity increases 3 times

(B) Both voltage and current sensitivity decreases by 33%

(C) Voltage sensitivity increases 3 times and current sensitivity remains constant

(D) Both voltage and current sensitivity remains constant

43. A circular current loop of magnetic moment M is in an arbitrary orientation in an external uniform magnetic field $\vec{B}$. The work done to rotate the loop by 30° about an axis perpendicular to its plane is

(A) $\sqrt{3}\frac{MB}{2}$

(B) Zero

(C) MB

(D) $\frac{MB}{2}$

44. In a permanent magnet at room temperature

(A) the individual molecules have non zero magnetic moment which are all perfectly aligned.

(B) domains are all perfectly aligned.

(C) magnetic moment of each molecule is zero.

(D) domains are partially aligned.

Space For Rough Work

45. Coersivity of a magnet where the ferromagnet gets completely demagnetized is 3×10^3 Am^{-1}. The minimum current required to be passed in a solenoid having 1000 turns per metre, so that the magnet gets completely demagnetized when placed inside the solenoid is

(A) 60 mA

(B) 6A

(C) 30 mA

(D) 3A

46. An inductor of inductance L and resistor R are joined together in series and connected by a source of frequency ω. The power dissipated in the circuit is

(A) $\frac{V^2R}{R^2+\omega^2L^2}$

(B) $\frac{V^2R}{\sqrt{R^2+\omega^2L^2}}$

(C) $\frac{R^2+\omega^2L^2}{V}$

(D) $\frac{V}{R^2+\omega^2L^2}$

47. An electromagnetic wave is travelling in x-direction with electric field vector given by,

$\vec{E}_y = E_0 \sin(kx - \omega t)\,\hat{j}$. The correct expression for magnetic field vector is

(A) $\vec{B}_z = E_0 C \sin(kx - \omega t)\,\hat{k}$

(B) $\vec{B}_z = \frac{E_0}{C}\sin(kx - \omega t)\,\hat{k}$

(C) $\vec{B}_y = E_0 C \sin(kx - \omega t)\,\hat{j}$

(D) $\vec{B}_y = \frac{E_0}{C}\sin(kx - \omega t)\,\hat{j}$

48. The phenomenon involved in the reflection of radio-waves by ionosphere is similar to

(A) total internal reflection of light in air during a mirage

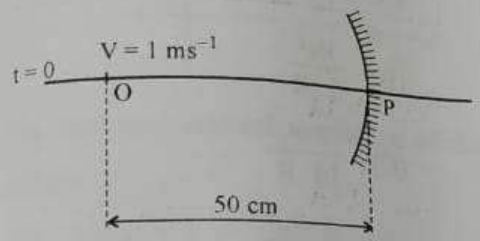
(B) scattering of light by air particles

(C) reflection of light by plane mirror

(D) dispersion of light by water molecules during the formation of a rainbow

Space For Rough Work

49. A point object is moving uniformly towards the pole of a concave mirror of focal length 25 cm along its axis as shown below. The speed of the object is 1 ms^{-1}. At t = 0, the distance of the object from the mirror is 50 cm. The average velocity of the image formed by the mirror between time t = 0 and t = 0.25 s is :



(A) 20 cm s^{-1}

(B) Infinity

(C) 40 cm s^{-1}

(D) Zero

50. A certain prism is found to produce a minimum deviation of 38°. It produces a deviation of 44° when the angle of incidence is either 42° or 62°. What is the angle of incidence when it is undergoing minimum deviation ?

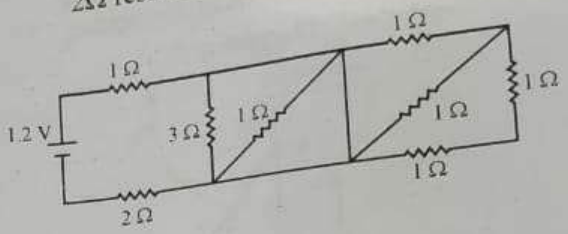
(A) 40°

(B) 60°

(C) 30°

(D) 49°

51. In the given circuit, the current through 2Ω resistor is



(A) 0.3A

(B) 0.1A

(C) 0.2A

(D) 0.4A

52. Kirchhoff's junction rule is a reflection of

(A) Conservation of energy

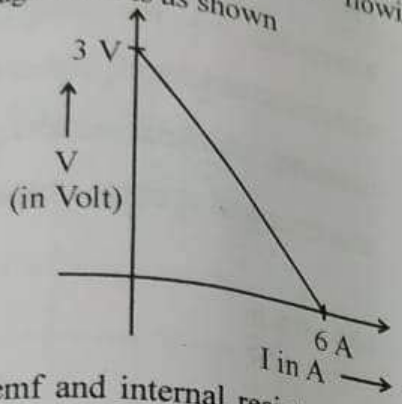
(B) Conservation of charges

(C) Conservation of current density vector

(D) Conservation of momentum

Space For Rough Work

53. The variation of terminal potential difference (V) with current flowing through a cell is as shown



The emf and internal resistance of the cell are

(A) 3V, 0.5Ω

(B) 6V, 0.5Ω

(C) 3V, 2Ω

(D) 6V, 2Ω

54. In a potentiometer experiment, the balancing point with a cell is at a length 240 cm. On shunting the cell with a resistance of 2Ω, the balancing length becomes 120 cm. The internal resistance of the cell is

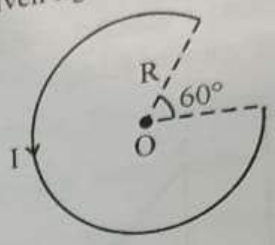
(A) 2Ω

(B) 0.5Ω

(C) 4Ω

(D) 1Ω

55. The magnetic field at the centre 'O' in the given figure is



(A) $\frac{5}{12}\frac{\mu_o I}{R}$

(B) $\frac{\mu_o I}{12R}$

(C) $\frac{7}{14}\frac{\mu_o I}{R}$

(D) $\frac{3}{10}\frac{\mu_o I}{R}$

56. An aluminium sphere is dipped into water. Which of the following is true ?

(A) Buoyancy will be more in water at 0 °C than that in water at 4 °C

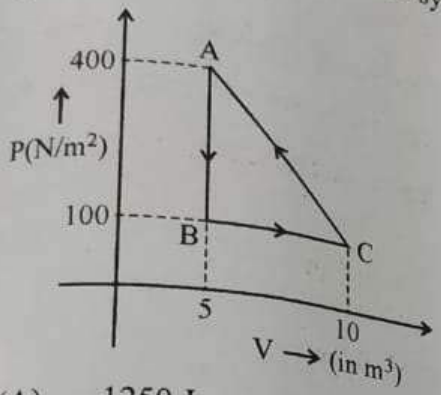
(B) Buoyancy may be more or less in water at 4 °C depending on the radius of the sphere

(C) Buoyancy will be less in water at 0 °C than that in water at 4 °C

(D) Buoyancy in water at 0 °C will be same as that in water at 4 °C

Space For Rough Work

57. A thermodynamic system undergoes a cyclic process ABC as shown in the diagram. The work done by the system per cycle is



(A) – 1250 J

(B) 1250 J

(C) 750 J

(D) – 750 J

58. One mole of O_2 gas is heated at constant pressure starting at 27 °C. How much energy must be added to the gas as heat to double its volume ?

(A) 450 R

(B) 1050 R

(C) Zero

(D) 750 R

59. A piston is performing S.H.M. in the vertical direction with a frequency of 0.5 Hz. A block of 10 kg is placed on the piston. The maximum amplitude of the system such that the block remains in contact with the piston is

(A) 0.5 m

(B) 0.1m

(C) 1 m

(D) 1.5 m

60. The equation of a stationary wave is $y = 2 \sin\left(\frac{\pi x}{15}\right) \cos(48\pi t)$. The distance between a node and its next antinode is

(A) 1.5 units

(B) 30 units

(C) 7.5 units

(D) 22.5 units

Space For Rough Work

Date : 22-MAY-19

COMMON ENTRANCE TEST - 2019

ANSWER KEYS - PHYSICS

Qnno	A1
1	1
2	2
3	4
4	3
5	3
6	1
7	4
8	3
9	3
10	1
11	1
12	3
13	2
14	2
15	3
16	1
17	4
18	1
19	2
20	2
21	3
22	2
23	3
24	1
25	2
26	G
27	1
28	2
29	2
30	4
31	2
32	3
33	1
34	2
35	1
36	2
37	4
38	2
39	4
40	3
41	1
42	3
43	4
44	1
45	1
46	3
47	4
48	2
49	2
50	2
51	3
52	2
53	3
54	1
55	4
56	3
57	3
58	1
59	2
60	3

Note:

1. G - Indicates One GRACE MARK Awarded for the Question Number.
2. Value more than four indicates multiple answers are correct.

1. Which of the following possess net dipole moment ?
(A) BF_3
(B) SO_2
(C) CO_2
(D) $BeCl_2$

2. The number of π-bonds and σ-bonds present in naphthalene are respectively
(A) 5, 19
(B) 6, 19
(C) 5, 20
(D) 5, 11

3. The reaction in which $\Delta H > \Delta U$ is
(A) $CaCO_{3(s)} \longrightarrow CaO_{(s)} + CO_{2(g)}$
(B) $N_{2(g)} + O_{2(g)} \longrightarrow 2NO_{(g)}$
(C) $CH_{4(g)} + 2O_{2(g)} \longrightarrow CO_{2(g)} + 2H_2O_{(l)}$
(D) $N_{2(g)} + 3H_{2(g)} \longrightarrow 2NH_{3(g)}$

4. The number of moles of electron required to reduce 0.2 mole of $Cr_2O_7^{-2}$ to Cr^{+3}
(A) 6
(B) 1.2
(C) 0.6
(D) 12

5. In the reaction $B(OH)_3 + 2H_2O \longrightarrow [B(OH)_4]^- + H_3O$
$B(OH)_3$ functions as
(A) Lewis base
(B) Protonic acid
(C) Lewis acid
(D) Bronsted acid

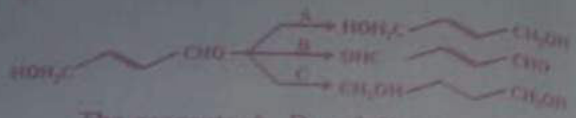
6. Match the following acids with their pKa values :

Acid		pKa
a. Phenol	i.	16
b. p-Nitrophenol	ii.	0.78
c. Ethanol	iii.	10.0
d. Picric acid	iv.	7.1

	a	b	c	d
(A)	ii	i	ii	iv
(B)	iii	iv	i	ii
(C)	iv	ii	iii	i
(D)	iii	i	iv	ii

7. Which of the following can be used to test the acidic nature of ethanol ?
(A) Na_2CO_3
(B) Blue litmus solution
(C) Na metal
(D) $NaHCO_3$

8.



The reagents A, B and C respectively are

(A) $NaBH_4$, alk. $KMnO_4$, H_2/Pd

(B) H_2/Pd, PCC, $NaBH_4$

(C) H_2/Pd, alk. $KMnO_4$, $NaBH_4$

(D) $NaBH_4$, PCC, H_2/Pd

9. Propanoic acid undergoes HVZ reaction to give chloropropanoic acid. The product obtained is

(A) as stronger as propanoic acid

(B) stronger acid than propanoic acid

(C) stronger than dichloropropanoic acid

(D) weaker acid than propanoic acid

10. $P \xrightarrow{H_2/Pd - BaSO_4} Q \xrightarrow[(ii)\ dil.\ HCl]{(i)\ con.\ NaOH} R + S$

R and S form benzyl benzoate when treated with each other. Hence P is

(A) $C_6H_5CH_2OH$

(B) C_6H_5CHO

(C) C_6H_5COOH

(D) C_6H_5COCl

11. Among the following, the main reactions occurring in blast furnace during extraction of iron from haematite are

i. $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$

ii. $FeO + SiO_2 \longrightarrow FeSiO_3$

iii. $Fe_2O_3 + 3C \longrightarrow 2Fe + 3CO$

iv. $CaO + SiO_2 \longrightarrow CaSiO_3$

(A) iii and iv

(B) i and ii

(C) i and iv

(D) ii and iii

12. Which of the following pair contains 2 lone pair of electrons on the central atom ?

(A) H_2O, NF_3

(B) I_3^-, H_2O

(C) SO_4^{2-}, H_2S

(D) XeF_4, NH_3

13. Which of the following statement is correct ?

(A) Cl_2 is a stronger oxidizing agent than F_2.

(B) Cl_2 oxidises H_2O to O_2 but F_2 does not.

(C) Fluoride is a good oxidising agent.

(D) F_2 oxidises H_2O to O_2 but Cl_2 does not.

Space For Rough Work

14. 0.1 mole of XeF_6 is treated with 1.8 g of water. The product obtained is
(A) XeO_2F_2
(B) XeO_3
(C) $Xe + XeO_3$
(D) $XeOF_4$

15. In the reaction of gold with aquaregia, oxidation state of Nitrogen changes from
(A) +6 to +4
(B) +4 to +2
(C) +3 to +1
(D) +5 to +2

16. The vitamin that helps in clotting of blood is
(A) C
(B) A
(C) K
(D) B_2

17. The polymer containing five methylene groups in its repeating unit is
(A) Nylon 6
(B) Nylon 6, 6
(C) Bakelite
(D) Dacron

18. Cis-1, 4-polyisoprene is called
(A) Neoprene
(B) Buna-N
(C) Natural rubber
(D) Buna-S

19. Which cleansing agent gets precipitated in hard water ?
(A) Sodium stearate
(B) Sodium lauryl sulphate
(C) Sodium dodecyl benzene sulphonate
(D) Cetyl trimethyl ammonium bromide

20. Anti-histamine among the following is
(A) Morphine
(B) Bromopheneramine
(C) Chloroxylenol
(D) Amoxycillin

Space For Rough Work

0.1 M
XeF_6 1.8 g

21. The elements in which electrons are progressively filled in 4f orbital are called

(A) Transition elements

(B) Actinoids

(C) Halogens

(D) Lanthanoids

22. Incorrect statement with reference to Ce ($Z = 58$)

(A) Ce in +3 oxidation state is more stable than in +4.

(B) Ce^{4+} is a reducing agent.

(C) Ce shows common oxidation states of +3 and +4.

(D) Atomic size of Ce is more than that of Lu.

23. A mixture of NaCl and $K_2Cr_2O_7$ is heated with conc. H_2SO_4, deep red vapours are formed. Which of the following statement is false ?

(A) The vapours contain CrO_2Cl_2 only.

(B) The vapours give a yellow solution with NaOH.

(C) The vapours when passed into lead acetate in acetic acid gives a yellow precipitate.

(D) The vapours contain CrO_2Cl_2 and Cl_2.

24. Which of the following statement is wrong ?

(A) Mn^{3+} and Co^{3+} are oxidizing agents in aqueous solution.

(B) In highest oxidation states, the transition metals show acidic character.

(C) All elements of 3d series exhibit variable oxidation states.

(D) Metals in highest oxidation states are more stable in oxides than in fluorides.

Space For Rough Work

25. Which among the following is the strongest ligand ?

(A) NH_3

(B) CN^-

(C) en

(D) CO

26. Which of the following is a network crystalline solid ?

(A) AlN

(B) I_2

(C) Ice

(D) NaCl

27. The number of atoms in 2.4 g of body centred cubic crystal with edge length 200 pm is

(density = 10 g cm^{-3}, $N_A = 6 \times 10^{23}$ atoms/mol)

(A) 6×10^{20}

(B) 6×10^{22}

(C) 6×10^{19}

(D) 6×10^{23}

28. 1 mole of NaCl is doped with 10^{-5} mole of $SrCl_2$. The number of cationic vacancies in the crystal lattice will be

(A) 6.022×10^{15}

(B) 6.022×10^{18}

(C) 12.044×10^{20}

(D) 6.022×10^{23}

29. A non-volatile solute, 'A' ietramerises in water to the extent of 80%. 2.5 g of 'A' in 100 g of water, lowers the freezing point by 0.3 °C. The molar mass of A in mol L^{-1} is (K_f for water = 1.86 K kg mol^{-1})

(A) 221

(B) 62

(C) 354

(D) 155

30. Solution 'A' contains acetone dissolved in chloroform and solution 'B' contains acetone dissolved in carbon disulphide. The type of deviations from Raoult's law shown by solutions A and B, respectively are

(A) positive and negative

(B) positive and positive

(C) negative and positive

(D) negative and negative

31. The mass of AgCl precipitated when a solution containing 11.70 g of NaCl is added to a solution containing 3.4 g of $AgNO_3$ is

[Atomic mass of Ag = 108, Atomic mass of Na = 23]

(A) 1.17 g

(B) 5.74 g

(C) 6.8 g

(D) 2.87 g

Space For Rough Work

32. Two particles A and B are in motion. If the wavelength associated with 'A' is 33.33 nm, the wavelength associated with 'B' whose momentum is $\frac{1}{3}^{rd}$ of 'A' is

(A) 2.5×10^{-8} m
(B) 1.0×10^{-8} m
(C) 1.0×10^{-7} m
(D) 1.25×10^{-7} m

33. The first ionization enthalpy of the following elements are in the order :

(A) P < Si < N < C
(B) C < N < Si < P
(C) Si < P < C < N
(D) P < Si < C < N

34. Solubility of AgCl is least in

(A) Pure water
(B) 0.1 M NaCl
(C) 0.1 M $AlCl_3$
(D) 0.1 M $BaCl_2$

35. Which of the following equations does NOT represent Charles's law for a given mass of gas at constant pressure ?

(A) $\log V = \log K + \log T$
(B) $\frac{V}{T} = K$
(C) $\frac{d(\ln V)}{dT} = \frac{1}{T}$
(D) $\log K = \log V + \log T$

36. Which is the most suitable reagent for the following conversion ?

$$CH_3 - CH = CH - CH_2 - \overset{\overset{O}{\|}}{C} - CH_3 \longrightarrow CH_3 - CH = CH - CH_2 - \overset{\overset{O}{\|}}{C} - OH$$

(A) I_2 and NaOH solution
(B) Tollen's reagent
(C) Sn and NaOH solution
(D) Benzoyl peroxide

37. Which of the following is least soluble in water at 298 K ?

(A) $(CH_3)_3N$
(B) CH_3NH_2
(C) $C_6H_5NH_2$
(D) $(CH_3)_2NH$

38. If Aniline is treated with 1 : 1 mixture of con. HNO_3 and con. H_2SO_4, p-nitroaniline and m-nitroaniline are formed nearly in equal amounts. This is due to

(A) protonation of $-NH_2$ which causes deactivation of benzene ring
(B) m-directing property of $-NH_2$ group
(C) isomerization of some p-nitroaniline into m-nitroaniline
(D) m & p directing property of $-NH_2$ group

Space For Rough Work

39. In nucleic acids, the nucleotides are joined together by
(A) Phosphodiester linkage
(B) Phosphoester linkage
(C) Sulphodiester linkage
(D) Phosphodisulphide linkage

40. Which of the following is generally water insoluble ?
(A) Vitamin-C
(B) Fibrous protein
(C) Glycine
(D) Amylose

41. Relative lowering of vapour pressure of a dilute solution of glucose dissolved in 1 kg of water is 0.002. The molality of the solution is
(A) 0.222
(B) 0.004
(C) 0.021
(D) 0.111

42. One litre solution of $MgCl_2$ is electrolyzed completely by passing a current of 1A for 16 min 5 sec. The original concentration of $MgCl_2$ solution was
(Atomic mass of Mg = 24)
(A) 5×10^{-2} M
(B) 5×10^{-3} M
(C) 1.0×10^{-2} M
(D) 0.5×10^{-3} M

43. An aqueous solution of $CuSO_4$ is subjected to electrolysis using inert electrodes. The pH of the solution will
(A) remains unchanged
(B) increase
(C) increase or decrease depending on the strength of the current.
(D) decrease

44. Give : $E^{\circ}_{Mn^{+3}|Mn^{+2}} = 1.5$ V and $E^{\circ}_{Mn^{+4}|Mn^{+2}} = 1.2$ V, then $E^{\circ}_{Mn^{+3}|Mn^{+4}}$ is
(A) 0.1 V
(B) 0.3 V
(C) 2.1 V
(D) 1.7 V

45. The plot of $t_{1/2}$ v/s $[R]_0$ for a reaction is a straight-line parallel to x-axis. The unit for the rate constant of this reaction is
(A) mol L^{-1} s^{-1}
(B) mol $L^{-1}s$
(C) s^{-1}
(D) L mol^{-1} s^{-1}

46. The metal nitrate that liberates NO_2 on heating
(A) $LiNO_3$
(B) $NaNO_3$
(C) $RbNO_3$
(D) KNO_3

Space For Rough Work

47. Which of the following is NOT true regarding the usage of hydrogen as a fuel ?

(A) The combustible energy of hydrogen can be directly converted to electrical energy in a fuel cell.

(B) High calorific value

(C) Hydrogen gas can be easily liquefied and stored.

(D) Combustion product is ecofriendly.

48. Resonance effect is not observed in

(A) $CH_2 = CH - C \equiv N$

(B) $CH_2 = CH - CH = CH_2$

(C) $CH_2 = CH - CH_2 - NH_2$

(D) $CH_2 = CH - Cl$

49. 2-butyne is reduced to trans-but-2-ene using

(A) Na in liq. NH_3

(B) $H_2 \mid Ni$

(C) Zn in dil. HCl

(D) $H_2 \mid Pd - C$

50. Eutrophication causes

(A) reduction in water pollution

(B) increase of nutrients in water

(C) decreases BOD

(D) reduction in dissolved oxygen

51. Addition of excess of $AgNO_3$ to an aqueous solution of 1 mole of $PdCl_2 \cdot 4NH_3$ gives 2 moles of $AgCl$. The conductivity of this solution corresponds to

(A) 1 : 3 electrolyte

(B) 1 : 1 electrolyte

(C) 1 : 4 electrolyte

(D) 1 : 2 electrolyte

52. The formula of penta aquanitrato chromium (III) nitrate is,

(A) $[Cr(H_2O)_6](NO_2)_2$

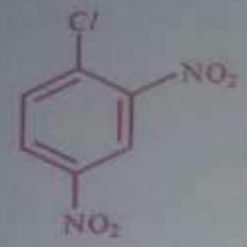
(B) $[Cr(H_2O)_6](NO_3)_3$

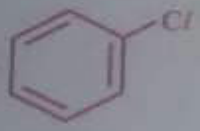
(C) $[Cr(H_2O)_5NO_2]NO_3$

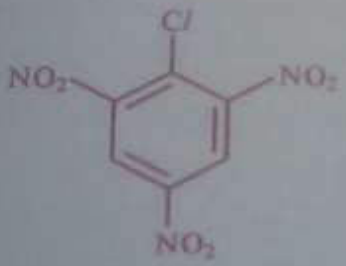
(D) $[Cr(H_2O)_5NO_3](NO_3)_2$

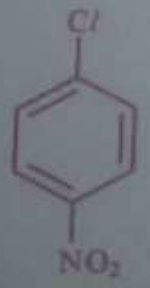
Space For Rough Work

53. Which of the following halide undergoes hydrolysis on warming with water/aqueous NaOH ?

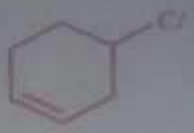
(A) 

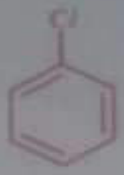
(B) • 

(C) 

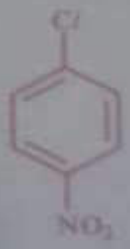
(D) 

54. The compound having longest C — Cl bond is

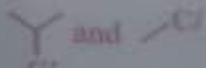
(A) 

(B) 

(C)• $CH_2 = CH - Cl$

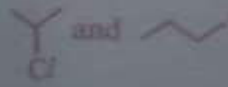
(D) 

55. The alkyl halides required to prepare  by Wurtz reaction are

(A) 

(B) 

(C) 

(D)• 

Space For Rough Work

R-[K+2Na+X]-K.

56. Which is a wrong statement ?

(A) $e^{-Ea/RT}$ gives the fraction of reactant molecules that are activated at the given temp

(B) Rate constant k = Arrhenius constant A : if Ea = 0

(C) presence of catalyst will not alter the value of Ea

(D) ln k vs $\frac{1}{T}$ plot is a straight line.

57. 1 L of 2 M CH_3COOH is mixed with 1 L of 3M C_2H_5OH to form an ester. The rate of the reaction with respect to the initial rate when each solution is diluted with an equal volume of water will be

(A) 2 times

(B) 0.25 times

(C) 4 times

(D) 0.5 times

58. Which of the following is an example of homogeneous catalysis ?

(A) oxidation of SO_2 in contact process

(B) oxidation of NH_3 in Ostwald's process

(C) manufacture of NH_3 by Haber's process

(D) oxidation of SO_2 in lead chamber process

59. Critical Micelle concentration for a soap solution is 1.5×10^{-4} mol L^{-1}. Micelle formation is possible only when the concentration of soap solution in mol L^{-1} is

(A) 4.6×10^{-5}

(B) 2.0×10^{-3}

(C) 1.1×10^{-4}

(D) 7.5×10^{-5}

60. Oxidation state of copper is +1 in

(A) Cuprite

(B) Malachite

(C) Chalcopyrite

(D) Azurite

Space For Rough Work

Date : 22-MAY-19

COMMON ENTRANCE TEST - 2019

ANSWER KEYS - CHEMISTRY

Qnno	A1
1	4
2	1
3	2
4	2
5	2
6	4
7	3
8	4
9	3
10	1
11	2
12	4
13	4
14	4
15	2
16	3
17	4
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26	2
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29	4
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35	4
36	2
37	2
38	4
39	3
40	2
41	3
42	4
43	4
44	3
45	2
46	4
47	1
48	2
49	1
50	34
51	2
52	1
53	2
54	2
55	4
56	3
57	1
58	1
59	1
60	4

Note:

1. G - Indicates One GRACE MARK Awarded for the Question Number.
2. Value more than four indicates multiple answers are correct.

ಸಾಮಾನ್ಯ ಪ್ರವೇಶ ಪರೀಕ್ಷೆ-2019

ದಿನಾಂಕ	ವಿಷಯ	ಸಮಯ	ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ	
			ವರ್ಷನ್ ಕೋಡ್	ಕ್ರಮ ಸಂಖ್ಯೆ
29-04-2019	ಗಣಿತ	ಮ. 2.30 ರಿಂದ 3.50 ರವರೆಗೆ	A-1	326841

ಒಟ್ಟು ಅವಧಿ	ಉತ್ತರಿಸಲು ಇರುವ ಗರಿಷ್ಠ ಅವಧಿ	ಗರಿಷ್ಠ ಅಂಕಗಳು	ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳು	ನಿಮ್ಮ ಸಿಇಟಿ ಸಂಖ್ಯೆಯನ್ನು ಬರೆಯಿರಿ
80 ನಿಮಿಷಗಳು	70 ನಿಮಿಷಗಳು	60	60	

ಮಾಡಿ

1. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮತ್ತು ಪ್ರವೇಶ ಪತ್ರದಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಸಿಇಟಿ ಸಂಖ್ಯೆ ಮತ್ತು ಹೆಸರು ಒಂದೇ ಆಗಿದೆಯೆ ಎಂದು ಮತ್ತೊಮ್ಮೆ ದೃಢೀಕರಿಸಿಕೊಳ್ಳಿ. ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ತಿಳಿಸಿ.
2. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಂದ ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ನಿಮಗೆ 2ನೇ ಬೆಲ್ ಆದ ನಂತರ, ಅಂದರೆ ಮ. 2.30 ಆದ ನಂತರ ಕೊಡಲಾಗುವುದು.
3. ನಿಮಗೆ ನೀಡಿರುವ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಒಂದೇ ಆಗಿರುವುದನ್ನು ಖಾತ್ರಿಪಡಿಸಿಕೊಳ್ಳಿ. ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ತಿಳಿಸಿ.
4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಮತ್ತು ಕ್ರಮ ಸಂಖ್ಯೆಯನ್ನು ನಾಮಿನಲ್ ರೋಲ್‌ನಲ್ಲಿ ತಪ್ಪಿಲ್ಲದೆ ಬರೆಯಬೇಕು.
5. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ಕೆಳಭಾಗದ ನಿಗದಿತ ಜಾಗದಲ್ಲಿ ಪೂರ್ಣ ಸಹಿ ಮಾಡಬೇಕು.

ಮಾಡಬೇಡಿ

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಟೈಮಿಂಗ್ ಮಾರ್ಕ್‌ನ್ನು ತಿದ್ದಬಾರದು / ಹಾಳುಮಾಡಬಾರದು / ಅಳಿಸಬಾರದು.
2. ಮೂರನೇ ಬೆಲ್ ಮ. 2.40 ಕ್ಕೆ ಆಗುತ್ತದೆ. ಅಲ್ಲಿಯವರೆಗೂ,
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ಅನ್ನು ತೆಗೆಯಬಾರದು.
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಒಳಗಡೆ ಇರುವ ಪ್ರಶ್ನೆಗಳನ್ನು ನೋಡಲು ಪ್ರಯತ್ನಿಸಬಾರದು ಅಥವಾ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸಬಾರದು.

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಮುಖ್ಯ ಸೂಚನೆಗಳು

1. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒಟ್ಟು 60 ಪ್ರಶ್ನೆಗಳಿದ್ದು, ಪ್ರತಿ ಪ್ರಶ್ನೆಗೂ 4 ಬಹು ಆಯ್ಕೆ ಉತ್ತರಗಳು ಇರುತ್ತವೆ.
2. ಮೂರನೇ ಬೆಲ್ ಅಂದರೆ ಮ. 2.40 ರ ನಂತರ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ತೆಗೆದು ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯಾವುದೇ ಪುಟಗಳು ಮುದ್ರಿತವಾಗಿಲ್ಲದೇ ಇರುವುದು ಕಂಡು ಬಂದಲ್ಲಿ ಅಥವಾ ಹರಿದು ಹೋಗಿದ್ದಲ್ಲಿ ಅಥವಾ ಯಾವುದೇ ಐಟಂಗಳು ಬಿಟ್ಟುಹೋಗಿದೆಯೇ ಎಂಬುದನ್ನು ಖಚಿತಪಡಿಸಿಕೊಂಡು, ಈ ರೀತಿ ಆಗಿದ್ದರೆ ಕೂಡಲೇ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಂದ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಿಕೊಳ್ಳಿ ನಂತರ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸುವುದು.
3. ಮುಂದಿನ 70 ನಿಮಿಷಗಳಲ್ಲಿ
   - ಪ್ರತಿ ಪ್ರಶ್ನೆಯನ್ನು ಎಚ್ಚರಿಕೆಯಿಂದ ಓದಿ.
   - ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ಕೊಟ್ಟಿರುವ ನಾಲ್ಕು ಬಹು ಆಯ್ಕೆಯ ಉತ್ತರಗಳಲ್ಲಿ ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ. ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ಉತ್ತರಗಳು ನಿಮ್ಮ ಗಮನಕ್ಕೆ ಬಂದರೂ ನಿಮಗೆ ಅತಿಉತ್ತಮವೆನಿಸಿದ ಒಂದನ್ನೇ ಆರಿಸುವುದು.
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗೆ ಅನುಗುಣವಾಗಿರುವ ಸರಿ ಉತ್ತರವನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಅದೇ ಕ್ರಮ ಸಂಖ್ಯೆಯ ಮುಂದೆ ನೀಡಿರುವ ಸಂಬಂಧಿಸಿದ ವೃತ್ತವನ್ನು **ನೀಲಿ ಅಥವಾ ಕಪ್ಪು** ಶಾಯಿಯ ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್‌ನಿಂದ ಸಂಪೂರ್ಣ ತುಂಬುವುದು.

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
(A) ● (C) (D)	✗ (B) (C) (D) ; (A) (B) (C) ✓ ; (A) ● ● (D) ; ● (B) (C) (D) ; (A) ● (C) (D)

4. ಈ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಸ್ಕ್ಯಾನ್ ಮಾಡುವ ಸ್ಕ್ಯಾನರ್ ಬಹಳ ಸೂಕ್ಷ್ಮವಾಗಿದ್ದು ಸಣ್ಣ ಗುರುತನ್ನು ಸಹ ದಾಖಲಿಸುತ್ತದೆ. ಆದ್ದರಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸುವಾಗ ಎಚ್ಚರಿಕೆ ವಹಿಸಿ.
5. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಕೊಟ್ಟಿರುವ ಖಾಲಿ ಜಾಗವನ್ನು ರಫ್ ಕೆಲಸಕ್ಕೆ ಉಪಯೋಗಿಸಿ. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಇದಕ್ಕೆ ಉಪಯೋಗಿಸಬೇಡಿ.
6. ಕೊನೆಯ ಬೆಲ್ ಅಂದರೆ ಮ. 3.50 ಆದ ನಂತರ ಉತ್ತರಿಸುವುದನ್ನು ನಿಲ್ಲಿಸಿ. ನಿಮ್ಮ ಎಡಗೈ ಹೆಬ್ಬರಳ ಗುರುತನ್ನು ನಿಗದಿತ ಜಾಗದಲ್ಲಿ ಹಾಕಿ.
7. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಯಥಾಸ್ಥಿತಿಯಲ್ಲಿ ನೀಡಿರಿ.
8. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ಮೇಲ್ಭಾಗದ ಹಾಳೆಯನ್ನು ಪ್ರತ್ಯೇಕಿಸಿ (ಕೆಇಎ ಪ್ರತಿ) ತನ್ನ ವಶದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡು ತಳಬದಿಯ ಯಥಾಪ್ರತಿಯನ್ನು (Candidate's Copy) ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸ್ವಯಂ ಮೌಲ್ಯಮಾಪನಕ್ಕಾಗಿ ಮನೆಗೆ ಕೊಂಡೊಯ್ಯಲು ಕೊಡುತ್ತಾರೆ.
9. ಉತ್ತರ ಪತ್ರಿಕೆಯ ನಕಲನ್ನು ಒಂದು ವರ್ಷ ಕಾಲ ಸುರಕ್ಷಿತವಾಗಿ ಇಡಿ.

ಸೂಚನೆ: ಕನ್ನಡ ಆವೃತ್ತಿಯ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ ಉತ್ತರಿಸುವ ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಕನ್ನಡದಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ ಪ್ರಶ್ನೆಗಳ ಬಗ್ಗೆ ಏನಾದರೂ ಸಂದೇಹವಿದ್ದಲ್ಲಿ ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಯ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ನೋಡಬಹುದು. ಏನಾದರೂ ವ್ಯತ್ಯಾಸ ಕಂಡುಬಂದಲ್ಲಿ ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಯನ್ನು ಅಂತಿಮ ಎಂದು ಪರಿಗಣಿಸಲಾಗುವುದು.

M A-1

MATHEMATICS

1. $\sqrt[3]{y}\sqrt{x} = \sqrt[6]{(x+y)^5}$ ಆದಾಗ $\frac{dy}{dx} =$

(A) $\frac{x}{y}$

(B) $x + y$

(C) $x - y$

(D) $\frac{y}{x}$

2. ಈ ಕೆಳಗಿನ ಯಾವುದರಲ್ಲಿ ರೋಲ ನ ಪ್ರಮೇಯವು ಅನ್ವಯವಾಗುವುದಿಲ್ಲ?

(A) $f(x) = x^2 - 4x + 5$ in $[1, 3]$

(B) $f(x) = x^2 - x$ in $[0, 1]$

(C) $f(x) = |x|$ in $[-2, 2]$

(D) $f(x) = [x]$ in $[2.5, 2.7]$

3. $f(x) = x^3 - 6x^2 + 9x + 10$ ಉತ್ಪನ್ನವು ವೃದ್ಧಿಸುವ ಅಂತರಾಳವು

(A) $(-\infty, 1) \cup (3, \infty)$

(B) $(-\infty, 1] \cup [3, \infty)$

(C) $[1, 3]$

(D) $(-\infty, -1] \cup [3, \infty)$

4. ಒಂದು ಸಮಬಾಹು ತ್ರಿಭುಜದ ಬಾಹುಗಳು 4 ಸೆ.ಮೀ/ಸೆ. ದರದಲ್ಲಿ ವೃದ್ಧಿಸುತ್ತಿವೆ. ತ್ರಿಭುಜದ ಬಾಹು 14 ಸೆ.ಮೀ. ಆಗುವಾಗ ಅದರ ವಿಸ್ತೀರ್ಣದ ದರದಲ್ಲಾಗುವ ವೃದ್ಧಿಯು

(A) $10\sqrt{3}$ cm^2/sec (ಚ. ಸೆ.ಮೀ/ಸೆ.)

(B) $14\sqrt{3}$ cm^2/sec (ಚ. ಸೆ.ಮೀ/ಸೆ.)

(C) 42 cm^2/sec (ಚ. ಸೆ.ಮೀ/ಸೆ.)

(D) 14 cm^2/sec (ಚ. ಸೆ.ಮೀ/ಸೆ.)

5. $\sqrt{24.99}$ ನ ಬೆಲೆಯು

(A) 4.999

(B) 4.899

(C) 5.001

(D) 4.897

6. $|3x - 5| \leq 2$ ಆದಾಗ

(A) $-1 \leq x \leq \frac{7}{3}$

(B) $1 \leq x \leq \frac{7}{3}$

(C) $1 \leq x \leq \frac{9}{3}$

(D) $-1 \leq x \leq \frac{9}{3}$

7. ಯಾದೃಚ್ಛಿಕ ಚರ 'X' ನ ವಿತರಣಾ ಸಂಭವನೀಯತೆಯನ್ನು ಈ ಕೆಳಗೆ ಕೊಟ್ಟಾಗ k ನ ಬೆಲೆಯು

X	1	2	3	4	5	6	7
P(X)	k–1	3k	k	3k	$3k^2$	k^2	k^2+k

Then the value of k is

(A) $\frac{1}{5}$

(B) -2

(C) $\frac{2}{7}$

(D) $\frac{1}{10}$

Space For Rough Work

MATHEMATICS

1. If $\sqrt[3]{y}\sqrt{x} = \sqrt[6]{(x+y)^5}$, then $\frac{dy}{dx} =$

   (A) $\frac{x}{y}$

   (B) $x + y$

   (C) $x - y$

   (D) $\frac{y}{x}$

2. Rolle's theorem is not applicable in which one of the following cases ?

   (A) $f(x) = x^2 - 4x + 5$ in $[1, 3]$

   (B) $f(x) = x^2 - x$ in $[0, 1]$

   (C) $f(x) = |x|$ in $[-2, 2]$

   (D) $f(x) = [x]$ in $[2.5, 2.7]$

3. The interval in which the function $f(x) = x^3 - 6x^2 + 9x + 10$ is increasing in

   (A) $(-\infty, 1) \cup (3, \infty)$

   (B) $(-\infty, 1] \cup [3, \infty)$

   (C) $[1, 3]$

   (D) $(-\infty, -1] \cup [3, \infty)$

4. The sides of an equilateral triangle are increasing at the rate of 4 cm/sec. The rate at which its area is increasing, when the side is 14 cm

   (A) $10\sqrt{3}$ cm^2/sec

   (B) $14\sqrt{3}$ cm^2/sec

   (C) 42 cm^2/sec

   (D) 14 cm^2/sec

5. The value of $\sqrt{24.99}$ is

   (A) 4.999

   (B) 4.899

   (C) 5.001

   (D) 4.897

6. If $|3x - 5| \leq 2$ then

   (A) $-1 \leq x \leq \frac{7}{3}$

   (B) $1 \leq x \leq \frac{7}{3}$

   (C) $1 \leq x \leq \frac{9}{3}$

   (D) $-1 \leq x \leq \frac{9}{3}$

7. A random variable 'X' has the following probability distribution :

X	1	2	3	4	5	6	7
P(X)	k–1	3k	k	3k	$3k^2$	k^2	k^2+k

   Then the value of k is

   (A) $\frac{1}{5}$

   (B) -2

   (C) $\frac{2}{7}$

   (D) $\frac{1}{10}$

Space For Rough Work

8. A ಮತ್ತು B ಗಳು S ವ್ಯೋಮದ ಎರಡು ಘಟನೆಗಳಾಗಿದ್ದು, $P(A) = 0.2$, $P(B) = 0.6$ ಮತ್ತು $P(A|B) = 0.5$ ಆಗಿದ್ದರೆ $P(A'|B) =$

(A) $\frac{3}{10}$

(B) $\frac{2}{3}$

(C) $\frac{1}{2}$

(D) $\frac{1}{3}$

9. 'X' ಗೆ ಒಂದು ದ್ವಿಪದ ವಿತರಣೆ ಇದೆ. ಅದರ ಪ್ರಮಿತಿಗಳು $n = 6$, p ಮತ್ತು $P(X = 2) = 12$, $P(X = 3) = 5$ ಆದರೆ $P =$

(A) $\frac{5}{12}$

(B) $\frac{16}{21}$

(C) $\frac{1}{2}$

(D) $\frac{5}{16}$

10. ಒಬ್ಬ ವ್ಯಕ್ತಿಯು 3 ರಲ್ಲಿ 2 ಸಲ ಸತ್ಯವನ್ನು ನುಡಿಯುತ್ತಾನೆ. ಅವನು ಸ್ವಾಭಾವಿಕ ಸಂಖ್ಯೆಗಳ ಗಣ $S = \{1, 2, 3, 4, 5, 6, 7\}$ ದಲ್ಲಿ ಒಂದು ಸಂಖ್ಯೆಯನ್ನು ಆರಿಸುತ್ತಾನೆ ಮತ್ತು ಅದು ಸಮ ಸಂಖ್ಯೆ ಎಂದು ವರದಿ ಮಾಡುತ್ತಾನೆ. ಆ ಸಂಖ್ಯೆಯು ನಿಜವಾಗಿಯೂ ಸಮಸಂಖ್ಯೆ ಆಗಿರುವ ಸಂಭವನೀಯತೆಯು

(A) $\frac{2}{5}$

(B) $\frac{1}{5}$

(C) $\frac{1}{10}$

(D) $\frac{3}{5}$

11. 100 ಗಣಾಂಶಗಳನ್ನು ಹೊಂದಿರುವ U ಎಂಬ ವಿಶ್ವಗಣದಲ್ಲಿ A ಮತ್ತು B ಗಳು ಗಣಗಳಾಗಿದ್ದು, $n(A) = 50$, $n(B) = 60$, $n(A \cap B) = 20$ ಆದಾಗ $n(A' \cap B') =$

(A) 40
(B) 20
(C) 90
(D) 10

12. $f : \mathbb{R} \to \mathbb{R}$ ನಲ್ಲಿ $f(x) = \sqrt{x^2 - 7x + 12}$ ಉತ್ಪನ್ನವನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿದಾಗ $f(x)$ ನ ಕ್ಷೇತ್ರವು

(A) $(-\infty, 3] \cup [4, \infty)$
(B) $(-\infty, 3] \cup (4, \infty)$
(C) $(-\infty, 3] \cap [4, \infty)$
(D) $(3, 4)$

Space For Rough Work

8. If A and B are two events of a sample space S such that P(A) = 0.2, P(B) = 0.6 and P(A|B) = 0.5 then P(A'|B) =

(A) $\frac{3}{10}$

(B) $\frac{2}{3}$

(C) $\frac{1}{2}$

(D) $\frac{1}{3}$

9. If 'X' has a binomial distribution with parameters n = 6, p and P(X = 2) = 12, P(X = 3) = 5 then P =

(A) $\frac{5}{12}$

(B) $\frac{16}{21}$

(C) $\frac{1}{2}$

(D) $\frac{5}{16}$

10. A man speaks truth 2 out of 3 times. He picks one of the natural numbers in the set S = {1, 2, 3, 4, 5, 6, 7} and reports that it is even. The probability that it is actually even is

(A) $\frac{2}{5}$

(B) $\frac{1}{5}$

(C) $\frac{1}{10}$

(D) $\frac{3}{5}$

11. If U is the universal set with 100 elements; A and B are two sets such that n(A) = 50, n(B) = 60, n(A∩B) = 20 then n (A'∩B') =

(A) 40

(B) 20

(C) 90

(D) 10

12. The domain of the function $f : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = \sqrt{x^2 - 7x + 12}$ is

(A) $(-\infty, 3] \cup [4, \infty)$

(B) $(-\infty, 3] \cup (4, \infty)$

(C) $(-\infty, 3] \cap [4, \infty)$

(D) $(3, 4)$

Space For Rough Work

13. $\cos x = |\sin x|$ ಸಮೀಕರಣದ ಸಾಮಾನ್ಯ ಪರಿಹಾರವು

(A) $x = n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$

(B) $x = 2n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$

(C) $x = n\pi + (-1)^n \frac{\pi}{4}, n \in \mathbb{Z}$

(D) $x = (2n+1)\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$

14. $\sqrt{3}\,\text{cosec}\,20° - \sec 20° =$

(A) 2
(B) 3
(C) 4
(D) 1

15. $P(n) : 2^n < n!$ ಇದನ್ನು ತೃಪ್ತಿಗೊಳಿಸುವ ಅತೀ ಚಿಕ್ಕ ಧನಾತ್ಮಕ ಪೂರ್ಣಾಂಕವು

(A) 2
(B) 3
(C) 4
(D) 5

16. $2x - y + z + 3 = 0$ ಸಮತಲಕ್ಕೆ (1, 3, 4) ಬಿಂದುವಿನಿಂದ ಎಳೆದ ಲಂಬಪಾದದ ಬಿಂದುವು

(A) (–1, 4, 3)
(B) (0, –4, –7)
(C) (1, 2, –3)
(D) (–3, 5, 2)

17. $\frac{x-5}{2} = \frac{y+1}{-1} = \frac{z+4}{1}$ ಸರಳರೇಖೆ ಹಾಗೂ $3x - 4y - z + 5 = 0$ ಸಮತಲಗಳ ನಡುವಿನ ಲಘು ಕೋನವು

(A) $\cos^{-1}\left(\frac{9}{\sqrt{364}}\right)$

(B) $\sin^{-1}\left(\frac{9}{\sqrt{364}}\right)$

(C) $\cos^{-1}\left(\frac{5}{2\sqrt{13}}\right)$

(D) $\sin^{-1}\left(\frac{5}{2\sqrt{13}}\right)$

18. (1, 2, 1) ಬಿಂದುವಿನಿಂದ $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-3}{2}$ ಸರಳ ರೇಖೆಗೆ ಇರುವ ಅಂತರವು

(A) $\frac{2\sqrt{3}}{5}$ (B) $\frac{2\sqrt{5}}{3}$

(C) $\frac{\sqrt{5}}{3}$ (D) $\frac{20}{3}$

19. XY-ಸಮತಲವು, A(2, 3, –5) ಮತ್ತು B(–1, –2, –3) ಬಿಂದುಗಳನ್ನು ಜೋಡಿಸುವ ಸರಳರೇಖೆಯನ್ನು ವಿಭಾಜಿಸುವ ಅನುಪಾತವು

(A) 2 : 1 ಆಂತರಿಕವಾಗಿ
(B) 3 : 2 ಬಾಹ್ಯವಾಗಿ
(C) 5 : 3 ಆಂತರಿಕವಾಗಿ
(D) 5 : 3 ಬಾಹ್ಯವಾಗಿ

Space For Rough Work

13. If $\cos x = |\sin x|$ then, the general solution is

(A) $x = n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$

(B) $x = 2n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$

(C) $x = n\pi + (-1)^n \frac{\pi}{4}, n \in \mathbb{Z}$

(D) $x = (2n+1)\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$

14. $\sqrt{3}\,\text{cosec}\,20° - \sec 20° =$

(A) 2

(B) 3

(C) 4

(D) 1

15. If $P(n) : 2^n < n!$ then the smallest positive integer for which P(n) is true, is

(A) 2

(B) 3

(C) 4

(D) 5

16. Foot of the perpendicular drawn from the point (1, 3, 4) to the plane $2x - y + z + 3 = 0$ is

(A) (–1, 4, 3)

(B) (0, –4, –7)

(C) (1, 2, –3)

(D) (–3, 5, 2)

17. Acute angle between the line $\frac{x-5}{2} = \frac{y+1}{-1} = \frac{z+4}{1}$ and the plane $3x - 4y - z + 5 = 0$ is

(A) $\cos^{-1}\left(\frac{9}{\sqrt{364}}\right)$

(B) $\sin^{-1}\left(\frac{9}{\sqrt{364}}\right)$

(C) $\cos^{-1}\left(\frac{5}{2\sqrt{13}}\right)$

(D) $\sin^{-1}\left(\frac{5}{2\sqrt{13}}\right)$

18. The distance of the point (1, 2, 1) from the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-3}{2}$ is

(A) $\frac{2\sqrt{3}}{5}$

(B) $\frac{2\sqrt{5}}{3}$

(C) $\frac{\sqrt{5}}{3}$

(D) $\frac{20}{3}$

19. XY-plane divides the line joining the points A(2, 3, –5) and B(–1, –2, –3) in the ratio

(A) 2 : 1 internally

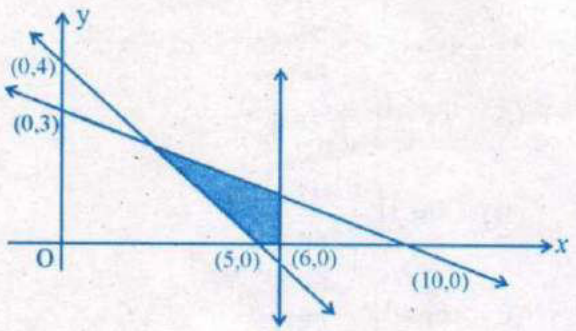
(B) 3 : 2 externally

(C) 5 : 3 internally

(D) 5 : 3 externally

Space For Rough Work

20. ನಕ್ಷೆಯಲ್ಲಿ ಗುರುತಿಸಿದ ಭಾಗವನ್ನು ನಿರೂಪಿಸುವ ಗಣ



(A) $4x + 5y \geq 20$, $3x + 10y \leq 30$, $x \leq 6$, $x, y \geq 0$

(B) $4x + 5y \geq 20$, $3x + 10y \leq 30$, $x \geq 6$, $x, y \geq 0$

(C) $4x + 5y \leq 20$, $3x + 10y \leq 30$, $x \leq 6$, $x, y \geq 0$

(D) $4x + 5y \leq 20$, $3x + 10y \leq 30$, $x \geq 6$, $x, y \geq 0$

21. $y = C_1e^{C_2+x} + C_3e^{C_4+x}$ ಅವಕಲಿತ ಸಮೀಕರಣದ ದರ್ಜೆಯು

(A) 1

(B) 2

(C) 3

(D) 4

22. $|\vec{a}| = 16, |\vec{b}| = 4$ ಆದಾಗ $\sqrt{|\vec{a} \times \vec{b}|^2 + |\vec{a} \cdot \vec{b}|^2} =$

(A) 4

(B) 8

(C) 16

(D) 64

23. ಸದಿಶಗಳಾದ $\vec{a}$ ಮತ್ತು $\vec{b}$ ಗಳ ನಡುವಿನ ಕೋನವು $\frac{2\pi}{3}$ ಆಗಿದ್ದು, $\vec{b}$ ನ ಮೇಲೆ $\vec{a}$ ನ ಪ್ರಕ್ಷೇಪ -2 ಆದಾಗ $|\vec{a}| =$

(A) 4

(B) 3

(C) 2

(D) 1

24. $\hat{i} + 2\hat{j} + \hat{k}$ ಮತ್ತು $-2\hat{i} + \hat{j} + 3\hat{k}$ ಸದಿಶಗಳನ್ನು ಹೊಂದಿರುವ ಸಮತಲಕ್ಕೆ ಲಂಬವಾಗಿರುವ ಏಕಮಾನ ಸದಿಶವು

(A) $\frac{\hat{i} + \hat{j} + \hat{k}}{\sqrt{3}}$

(B) $\frac{\hat{i} + \hat{j} - \hat{k}}{\sqrt{3}}$

(C) $\frac{-\hat{i} + \hat{j} - \hat{k}}{\sqrt{3}}$

(D) $\frac{-\hat{i} - \hat{j} - \hat{k}}{\sqrt{3}}$

25. $[\vec{a} + 2\vec{b} - \vec{c}, \vec{a} - \vec{b}, \vec{a} - \vec{b} - \vec{c}] =$

(A) 0

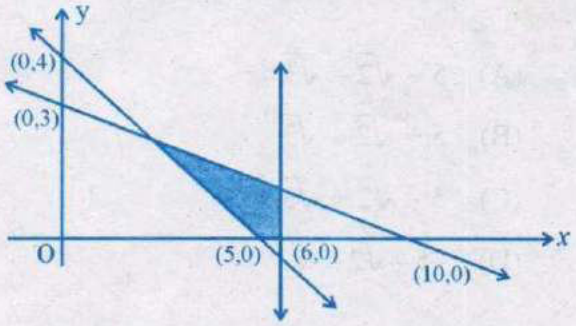
(B) $[\vec{a}, \vec{b}, \vec{c}]$

(C) $2[\vec{a}, \vec{b}, \vec{c}]$

(D) $3[\vec{a}, \vec{b}, \vec{c}]$

Space For Rough Work

20. The shaded region in the figure is the solution set of the inequations



(A) $4x + 5y \geq 20,\ 3x + 10y \leq 30,\ x \leq 6,\ x, y \geq 0$

(B) $4x + 5y \geq 20,\ 3x + 10y \leq 30,\ x \geq 6,\ x, y \geq 0$

(C) $4x + 5y \leq 20,\ 3x + 10y \leq 30,\ x \leq 6,\ x, y \geq 0$

(D) $4x + 5y \leq 20,\ 3x + 10y \leq 30,\ x \geq 6,\ x, y \geq 0$

21. The order of the differential equation $y = C_1e^{C_2+x} + C_3e^{C_4+x}$ is

(A) 1

(B) 2

(C) 3

(D) 4

22. If $|\vec{a}| = 16, |\vec{b}| = 4$ then, $\sqrt{|\vec{a} \times \vec{b}|^2 + |\vec{a} \cdot \vec{b}|^2} =$

(A) 4

(B) 8

(C) 16

(D) 64

23. If the angle between $\vec{a}$ and $\vec{b}$ is $\frac{2\pi}{3}$ and the projection of $\vec{a}$ in the direction of $\vec{b}$ is -2, then $|\vec{a}| =$

(A) 4

(B) 3

(C) 2

(D) 1

24. A unit vector perpendicular to the plane containing the vectors $\hat{i} + 2\hat{j} + \hat{k}$ and $-2\hat{i} + \hat{j} + 3\hat{k}$ is

(A) $\frac{\hat{i} + \hat{j} + \hat{k}}{\sqrt{3}}$

(B) $\frac{\hat{i} + \hat{j} - \hat{k}}{\sqrt{3}}$

(C) $\frac{-\hat{i} + \hat{j} - \hat{k}}{\sqrt{3}}$

(D) $\frac{-\hat{i} - \hat{j} - \hat{k}}{\sqrt{3}}$

25. $[\vec{a} + 2\vec{b} - \vec{c},\ \vec{a} - \vec{b},\ \vec{a} - \vec{b} - \vec{c}] =$

(A) 0

(B) $[\vec{a}, \vec{b}, \vec{c}]$

(C) $2[\vec{a}, \vec{b}, \vec{c}]$

(D) $3[\vec{a}, \vec{b}, \vec{c}]$

Space For Rough Work

26. $\int_{-3}^{3} \cot^{-1}x \, dx =$

(A) 3π

(B) 0

(C) 6π

(D) 3

27. $\int \frac{1}{\sqrt{x}+x\sqrt{x}} dx =$

(A) $2\log(\sqrt{x}+1)+C$

(B) $\frac{1}{2}\tan^{-1}\sqrt{x}+C$

(C) $\tan^{-1}\sqrt{x}+C$

(D) $2\tan^{-1}\sqrt{x}+C$

28. $\int \frac{2x-1}{(x-1)(x+2)(x-3)} dx = A\log|x-1|+B\log|x+2|+C\log|x-3|+K$ ಆದಾಗ A, B, C ಗಳು ಅನುಕ್ರಮವಾಗಿ

(A) $\frac{-1}{6},\frac{1}{3},\frac{-1}{2}$

(B) $\frac{1}{6},\frac{1}{3},\frac{1}{5}$

(C) $\frac{1}{6},\frac{-1}{3},\frac{1}{3}$

(D) $\frac{-1}{6},\frac{-1}{3},\frac{1}{2}$

29. $\int_{0}^{2} [x^2] \, dx =$

(A) $5-\sqrt{2}-\sqrt{3}$

(B) $5+\sqrt{2}-\sqrt{3}$

(C) $5-\sqrt{2}+\sqrt{3}$

(D) $-5-\sqrt{2}-\sqrt{3}$

30. $\int_{0}^{1} \sqrt{\frac{1+x}{1-x}} dx =$

(A) $\frac{\pi}{2}-1$

(B) $\frac{\pi}{2}+1$

(C) $\frac{\pi}{2}$

(D) $\frac{1}{2}$

31. α ಮತ್ತು β ಗಳು $x^2+x+1=0$ ಸಮೀಕರಣದ ಮೂಲಗಳಾಗಿದ್ದರೆ $\alpha^2+\beta^2$ ಎಂಬುದು

(A) 1

(B) $\frac{-1+i\sqrt{3}}{2}$

(C) $\frac{-1-i\sqrt{3}}{2}$

(D) -1

Space For Rough Work

26. $\int_{-3}^{3} \cot^{-1}x \, dx =$

(A) 3π

(B) 0

(C) 6π

(D) 3

27. $\int \frac{1}{\sqrt{x}+x\sqrt{x}} dx =$

(A) $2\log(\sqrt{x}+1)+C$

(B) $\frac{1}{2}\tan^{-1}\sqrt{x}+C$

(C) $\tan^{-1}\sqrt{x}+C$

(D) $2\tan^{-1}\sqrt{x}+C$

28. $\int \frac{2x-1}{(x-1)(x+2)(x-3)} dx = A \log|x-1|+B\log|x+2|+C\log|x-3|+K$, then A, B, C are respectively

(A) $\frac{-1}{6},\frac{1}{3},\frac{-1}{2}$

(B) $\frac{1}{6},\frac{1}{3},\frac{1}{5}$

(C) $\frac{1}{6},\frac{-1}{3},\frac{1}{3}$

(D) $\frac{-1}{6},\frac{-1}{3},\frac{1}{2}$

29. $\int_{0}^{2} [x^2] \, dx =$

(A) $5-\sqrt{2}-\sqrt{3}$

(B) $5+\sqrt{2}-\sqrt{3}$

(C) $5-\sqrt{2}+\sqrt{3}$

(D) $-5-\sqrt{2}-\sqrt{3}$

30. $\int_{0}^{1} \sqrt{\frac{1+x}{1-x}} dx =$

(A) $\frac{\pi}{2}-1$

(B) $\frac{\pi}{2}+1$

(C) $\frac{\pi}{2}$

(D) $\frac{1}{2}$

31. If α and β are roots of the equation $x^2+x+1=0$ then $\alpha^2+\beta^2$ is

(A) 1

(B) $\frac{-1+i\sqrt{3}}{2}$

(C) $\frac{-1-i\sqrt{3}}{2}$

(D) -1

Space For Rough Work

32. 1, 2, 3, 4, 5, 6, 7 ಅಂಕೆಗಳಲ್ಲಿ ಪುನರಾವರ್ತನೆ ಮಾಡದೇ ಎರಡು ಸಮ ಹಾಗೂ ಎರಡು ಬೆಸಸಂಖ್ಯೆ ಬರುವ ಹಾಗೆ ರಚಿಸಬಹುದಾದ 4 ಅಂಕೆಗಳ ಸಂಖ್ಯೆಯು

(A) 432
(B) 436
(C) 450
(D) 454

33. $(x^2 + y^2)^{25} - (x^2 - y^2)^{25}$ ನ್ನು ವಿಸ್ತರಿಸಿ ಸರಳೀಕರಿಸಿದಾಗ ದೊರೆಯುವ ಪದಗಳ ಸಂಖ್ಯೆ

(A) 0
(B) 13
(C) 26
(D) 50

34. ಒಂದು ಗುಣೋತ್ತರ ಶ್ರೇಢಿಯ ಮೂರನೇ ಪದವು 9 ಆದಾಗ ಅದರ ಮೊದಲ ಐದು ಪದಗಳ ಗುಣಲಬ್ಧವು

(A) 3^5
(B) 3^9
(C) 3^{10}
(D) 3^{12}

35. ಸರಳ ರೇಖೆಯೊಂದು ನಿರ್ದೇಶಕ ಅಕ್ಷಗಳೊಂದಿಗೆ ಸಮ ಛೇದಕಗಳನ್ನು ಉಂಟುಮಾಡಿದರೆ, ಆ ರೇಖೆಯು ಧನಾತ್ಮಕ X-ಅಕ್ಷದೊಂದಿಗೆ ಉಂಟುಮಾಡುವ ಕೋನವು

(A) 45°
(B) 90°
(C) 120°
(D) 135°

36. $\int x^3 \sin 3x \, dx =$

(A) $-\frac{x^3 \cos 3x}{3} - \frac{x^2 \sin 3x}{3} + \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

(B) $\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} - \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

(C) $-\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} + \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

(D) $-\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} - \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

37. $y^2 = x$ ಪರವಲಯ ಮತ್ತು $x^2 + y^2 = 2x$ ವೃತ್ತದ ನಡುವಿನ X-ಅಕ್ಷದ ಮೇಲೆ ಇರುವ ವಲಯದ ವಿಸ್ತೀರ್ಣವು ಚದರ ಮಾನಗಳಲ್ಲಿ

(A) $\frac{\pi}{4} - \frac{3}{2}$
(B) $\frac{3}{2} - \frac{\pi}{4}$
(C) $\frac{2}{3} - \frac{\pi}{4}$
(D) $\frac{\pi}{4} - \frac{2}{3}$

Space For Rough Work

32. The number of 4 digit numbers without repetition that can be formed using the digits 1, 2, 3, 4, 5, 6, 7 in which each number has two odd digits and two even digits is
(A) 432
(B) 436
(C) 450
(D) 454

33. The number of terms in the expansion of $(x^2 + y^2)^{25} - (x^2 - y^2)^{25}$ after simplification is
(A) 0
(B) 13
(C) 26
(D) 50

34. The third term of a G.P. is 9. The product of its first five terms is
(A) 3^5
(B) 3^9
(C) 3^{10}
(D) 3^{12}

35. A line cuts off equal intercepts on the co-ordinate axes. The angle made by this line with the positive direction of X-axis is
(A) 45°
(B) 90°
(C) 120°
(D) 135°

36. $\int x^3 \sin 3x \, dx =$
(A) $-\frac{x^3 \cos 3x}{3} - \frac{x^2 \sin 3x}{3} + \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$
(B) $\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} - \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$
(C) $-\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} + \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$
(D) $-\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} - \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

37. The area of the region above X-axis included between the parabola $y^2 = x$ and the circle $x^2 + y^2 = 2x$ in square units is
(A) $\frac{\pi}{4} - \frac{3}{2}$
(B) $\frac{3}{2} - \frac{\pi}{4}$
(C) $\frac{2}{3} - \frac{\pi}{4}$
(D) $\frac{\pi}{4} - \frac{2}{3}$

Space For Rough Work

38. Y-ಅಕ್ಷ, $y = \cos x$ ಮತ್ತು $y = \sin x$; $0 \le x \le \frac{\pi}{2}$ ದಿಂದ ಆವೃತಗೊಂಡಿರುವ ವಲಯದ ವಿಸ್ತೀರ್ಣವು

(A) $\sqrt{2} - 1$ Sq. units (ಚ. ಮಾನಗಳು)

(B) $\sqrt{2}$ Sq. units (ಚ. ಮಾನಗಳು)

(C) $\sqrt{2} + 1$ Sq. units (ಚ. ಮಾನಗಳು)

(D) $2 - \sqrt{2}$ Sq. units (ಚ. ಮಾನಗಳು)

39. $(2x + 3y^2)\, dy = y\, dx$ $(y > 0)$ ಅವಕಲಿತ ಸಮೀಕರಣದ ಅನುಕಲನ ಅಪವರ್ತನವು

(A) $e^{\frac{1}{y}}$

(B) $-\frac{1}{y^2}$

(C) $\frac{1}{x}$

(D) $\frac{1}{y^2}$

40. ಒಂದು ವಕ್ರರೇಖೆಗೆ ಯಾವುದೇ ಬಿಂದು (x, y) ನಲ್ಲಿ ಎಳೆದ ಸ್ಪರ್ಶಕದ ಓಟವು ಆ ಬಿಂದುವಿನ ನಿರ್ದೇಶಕಗಳ ಗುಣಲಬ್ಧವಾಗಿದ್ದು (1, 1) ಬಿಂದುವಿನ ಮೂಲಕ ಹಾದು ಹೋದರೆ, ಆ ವಕ್ರರೇಖೆಯ ಸಮೀಕರಣವು

(A) $2 \log x = y^2 - 1$

(B) $2 \log y = x^2 + 1$

(C) $2 \log y = x^2 - 1$

(D) $2 \log x = y^2 + 1$

41. ದೀರ್ಘವೃತ್ತ $9x^2 + 25y^2 = 225$ ನ ಉತ್ಕೇಂದ್ರತೆಯು

(A) $\frac{4}{5}$

(B) $\frac{3}{5}$

(C) $\frac{3}{4}$

(D) $\frac{9}{16}$

42. $\sum_{r=1}^{n} (2r-1) = x$ ಆದಾಗ

$$\lim_{n \to \infty} \left[\frac{1^3}{x^2} + \frac{2^3}{x^2} + \frac{3^3}{x^2} + \ldots\ldots + \frac{n^3}{x^2} \right] =$$

(A) $\frac{1}{2}$

(B) $\frac{1}{4}$

(C) 1

(D) 4

43. "ಎಲ್ಲಾ ಅವಿಚ್ಛಿನ್ನ ಉತ್ಪನ್ನಗಳು ನಿಷ್ಪನ್ನವಾಗುತ್ತವೆ." ಈ ಉಕ್ತಿಯ ನಕಾರಾತ್ಮಕ ಉಕ್ತಿಯು

(A) ಎಲ್ಲಾ ಅವಿಚ್ಛಿನ್ನ ಉತ್ಪನ್ನಗಳು ನಿಷ್ಪನ್ನವಾಗುವುದಿಲ್ಲ.

(B) ಕೆಲವು ಅವಿಚ್ಛಿನ್ನ ಉತ್ಪನ್ನಗಳು ನಿಷ್ಪನ್ನವಾಗುತ್ತವೆ.

(C) ಕೆಲವು ಅವಿಚ್ಛಿನ್ನ ಉತ್ಪನ್ನಗಳು ನಿಷ್ಪನ್ನವಾಗುವುದಿಲ್ಲ.

(D) ಎಲ್ಲಾ ನಿಷ್ಪನ್ನ ಉತ್ಪನ್ನಗಳು ಅವಿಚ್ಛಿನ್ನವಾಗುತ್ತವೆ.

Space For Rough Work

38. The area of the region bounded by Y-axis, $y = \cos x$ and $y = \sin x$; $0 \le x \le \frac{\pi}{2}$ is

(A) $\sqrt{2} - 1$ Sq. units

(B) $\sqrt{2}$ Sq. units

(C) $\sqrt{2} + 1$ Sq. units

(D) $2 - \sqrt{2}$ Sq. units

39. The integrating factor of the differential equation $(2x + 3y^2)\, dy = y\, dx\ (y > 0)$ is

(A) $e^{\frac{1}{y}}$

(B) $-\frac{1}{y^2}$

(C) $\frac{1}{x}$

(D) $\frac{1}{y^2}$

40. The equation of the curve passing through the point (1, 1) such that the slope of the tangent at any point (x, y) is equal to the product of its co-ordinates is

(A) $2 \log x = y^2 - 1$

(B) $2 \log y = x^2 + 1$

(C) $2 \log y = x^2 - 1$

(D) $2 \log x = y^2 + 1$

41. The eccentricity of the ellipse $9x^2 + 25y^2 = 225$ is

(A) $\frac{4}{5}$

(B) $\frac{3}{5}$

(C) $\frac{3}{4}$

(D) $\frac{9}{16}$

42. $\sum_{r=1}^{n}(2r-1) = x$ then

$$\lim_{n \to \infty}\left[\frac{1^3}{x^2} + \frac{2^3}{x^2} + \frac{3^3}{x^2} + \ldots\ldots\ldots + \frac{n^3}{x^2}\right] =$$

(A) $\frac{1}{2}$

(B) $\frac{1}{4}$

(C) 1

(D) 4

43. The negation of the statement "All continuous functions are differentiable."

(A) All continuous functions are not differentiable.

(B) Some continuous functions are differentiable.

(C) Some continuous functions are not differentiable.

(D) All differentiable functions are continuous.

Space For Rough Work

44. 100 ದತ್ತಾಂಶಗಳ ಮಧ್ಯಾಂಕ ಮತ್ತು ಮಾನಕ ವಿಚಲನೆಯು ಅನುಕ್ರಮವಾಗಿ 50 ಮತ್ತು 4 ಆಗಿದ್ದರೆ, ಆ ದತ್ತಾಂಶಗಳ ವರ್ಗಗಳ ಮೊತ್ತವು

(A) 251600
(B) 256100
(C) 266000
(D) 261600

45. 'EQUATIONS' ಎಂಬ ಪದದ ಅಕ್ಷರಗಳಿಂದ ಎರಡು ಅಕ್ಷರಗಳನ್ನು ಆಯ್ಕೆ ಮಾಡಲಾಗಿದೆ. ಆ ಅಕ್ಷರಗಳಲ್ಲಿ ಒಂದು ಸ್ವರ ಹಾಗೂ ಒಂದು ವ್ಯಂಜನವಾಗುವ ಸಂಭವನೀಯತೆಯು

(A) $\frac{8}{9}$
(B) $\frac{4}{9}$
(C) $\frac{3}{9}$
(D) $\frac{5}{9}$

46. $\begin{vmatrix} 3x+1 & 2x-1 & x+2 \\ 5x-1 & 3x+2 & x+1 \\ 7x-2 & 3x+1 & 4x-1 \end{vmatrix}$ ನ್ನು ವಿಸ್ತರಿಸಿದಾಗ ದೊರೆಯುವ ಸ್ಥಿರಾಂಕವು

(A) 0
(B) 2
(C) –10
(D) 6

47. $[x]$ ಎಂಬುದು ಗರಿಷ್ಠ ಪೂರ್ಣಾಂಕ ಉತ್ಪನ್ನವನ್ನು ಪ್ರತಿನಿಧಿಸಿದರೆ ಹಾಗೂ $f(x) = x - [x] - \cos x$ ಆದಾಗ $f'\left(\frac{\pi}{2}\right) =$

(A) 0
(B) 1
(C) 2
(D) ಅಸ್ತಿತ್ವದಲ್ಲಿರುವುದಿಲ್ಲ

48. $f(x) = \begin{cases} \frac{\sin 3x}{e^{2x}-1} & ; \quad x \neq 0 \\ k-2 & ; \quad x = 0 \end{cases}$ ಎಂಬುದು $x = 0$ ನಲ್ಲಿ ಅವಿಚ್ಛಿನ್ನವಾದಾಗ $k =$

(A) $\frac{3}{2}$
(B) $\frac{9}{5}$
(C) $\frac{1}{2}$
(D) $\frac{2}{3}$

49. $f(x) = \sin^{-1}\left[\frac{2^{x+1}}{1+4^x}\right]$ ಆದಾಗ $f'(0) =$

(A) $2 \log 2$
(B) $\log 2$
(C) $\frac{2\log 2}{5}$
(D) $\frac{4\log 2}{5}$

Space For Rough Work

44. Mean and standard deviation of 100 items are 50 and 4 respectively. The sum of all squares of the items is

(A) 251600

(B) 256100

(C) 266000

(D) 261600

45. Two letters are chosen from the letters of the word 'EQUATIONS'. The probability that one is vowel and the other is consonant is

(A) $\frac{8}{9}$

(B) $\frac{4}{9}$

(C) $\frac{3}{9}$

(D) $\frac{5}{9}$

46. The constant term in the expansion of

$$\begin{vmatrix} 3x+1 & 2x-1 & x+2 \\ 5x-1 & 3x+2 & x+1 \\ 7x-2 & 3x+1 & 4x-1 \end{vmatrix}$$ is

(A) 0

(B) 2

(C) –10

(D) 6

47. If $[x]$ represents the greatest integer function and $f(x) = x - [x] - \cos x$ then $f'\left(\frac{\pi}{2}\right) =$

(A) 0

(B) 1

(C) 2

(D) does not exist

48. if $f(x) = \begin{cases} \frac{\sin 3x}{e^{2x}-1} & ; \quad x \neq 0 \\ k-2 & ; \quad x = 0 \end{cases}$ is continuous at $x = 0$, then $k =$

(A) $\frac{3}{2}$

(B) $\frac{9}{5}$

(C) $\frac{1}{2}$

(D) $\frac{2}{3}$

49. If $f(x) = \sin^{-1}\left[\frac{2^{x+1}}{1+4^x}\right]$, then $f'(0) =$

(A) $2 \log 2$

(B) $\log 2$

(C) $\frac{2\log 2}{5}$

(D) $\frac{4\log 2}{5}$

Space For Rough Work

50. $x = a\sec^2\theta, y = a\tan^2\theta$ ಆದಾಗ $\frac{d^2y}{dx^2} =$

(A) 2a

(B) 1

(C) 0

(D) 4

51. $\begin{bmatrix} 2 & 5 & 0 \\ 0 & 1 & 1 \\ -1 & 0 & 3 \end{bmatrix}$ ಮಾತೃಕೆಯ ಪ್ರತಿಲೋಮ ಮಾತೃಕೆಯು

(A) $\begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$

(B) $\begin{bmatrix} 3 & -5 & 5 \\ -1 & -6 & -2 \\ 1 & -5 & 2 \end{bmatrix}$

(C) $\begin{bmatrix} 3 & -15 & 5 \\ -1 & 6 & -2 \\ 1 & -5 & 2 \end{bmatrix}$

(D) $\begin{bmatrix} 3 & -15 & 5 \\ -1 & 6 & -2 \\ 1 & -5 & -2 \end{bmatrix}$

52. P ಮತ್ತು Q ಗಳು ಸಮದರ್ಜೆಯ ಸಮಾಂಗ ಮಾತೃಕೆಗಳಾಗಿದ್ದರೆ, PQ – QP ಎಂಬುದು ಒಂದು

(A) ಏಕಮಾನ ಮಾತೃಕೆ

(B) ಸಮಾಂಗ ಮಾತೃಕೆ

(C) ಶೂನ್ಯ ಮಾತೃಕೆ

(D) ವಿಷಮಾಂಗ ಮಾತೃಕೆ

53. $3A + 4B' = \begin{bmatrix} 7 & -10 & 17 \\ 0 & 6 & 31 \end{bmatrix}$ ಮತ್ತು $2B - 3A' = \begin{bmatrix} -1 & 18 \\ 4 & 0 \\ -5 & -7 \end{bmatrix}$ ಆದಾಗ B =

(A) $\begin{bmatrix} 1 & 3 \\ -1 & 1 \\ 2 & 4 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & -3 \\ -1 & 1 \\ 2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} -1 & -18 \\ 4 & -16 \\ -5 & -7 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 3 \\ -1 & 1 \\ 2 & -4 \end{bmatrix}$

Space For Rough Work

50. If $x = a\sec^2\theta$, $y = a\tan^2\theta$ then $\frac{d^2y}{dx^2} =$

(A) 2a

(B) 1

(C) 0

(D) 4

51. The inverse of the matrix $\begin{bmatrix} 2 & 5 & 0 \\ 0 & 1 & 1 \\ -1 & 0 & 3 \end{bmatrix}$ is

(A) $\begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$

(B) $\begin{bmatrix} 3 & -5 & 5 \\ -1 & -6 & -2 \\ 1 & -5 & 2 \end{bmatrix}$

(C) $\begin{bmatrix} 3 & -15 & 5 \\ -1 & 6 & -2 \\ 1 & -5 & 2 \end{bmatrix}$

(D) $\begin{bmatrix} 3 & -15 & 5 \\ -1 & 6 & -2 \\ 1 & -5 & -2 \end{bmatrix}$

52. If P and Q are symmetric matrices of the same order then PQ – QP is

(A) identity matrix

(B) symmetric matrix

(C) zero matrix

(D) skew symmetric matrix

53. If $3A + 4B' = \begin{bmatrix} 7 & -10 & 17 \\ 0 & 6 & 31 \end{bmatrix}$ and $2B - 3A' = \begin{bmatrix} -1 & 18 \\ 4 & 0 \\ -5 & -7 \end{bmatrix}$ then B =

(A) $\begin{bmatrix} 1 & 3 \\ -1 & 1 \\ 2 & 4 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & -3 \\ -1 & 1 \\ 2 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} -1 & -18 \\ 4 & -16 \\ -5 & -7 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 3 \\ -1 & 1 \\ 2 & -4 \end{bmatrix}$

Space For Rough Work

54. $A = \begin{bmatrix} 1 & 3 \\ 4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -1 \\ 1 & 2 \end{bmatrix}$, ಆದಾಗ $|ABB'| =$

(A) 50
(B) –250
(C) 100
(D) 250

55. ಒಂದು ಮೂರನೇ ದರ್ಜೆಯ ನಿರ್ಧಾರಕದ ಬೆಲೆಯು 16 ಆಗಿದ್ದು, ಆ ನಿರ್ಧಾರಕದ ಅಂಶಗಳನ್ನು ಅವುಗಳ ಸಹಗುಣಕಗಳಿಂದ ಬದಲಿಸಿದಾಗ, ನಿರ್ಧಾರಕದ ಬೆಲೆಯು

(A) 96
(B) 48
(C) 256
(D) 16

56. $f : \mathbb{R} \to \mathbb{R}$ ಮತ್ತು $g : [0, \infty) \to \mathbb{R}$ ನಲ್ಲಿ $f(x) = x^2$ ಮತ್ತು $g(x) = \sqrt{x}$ ಎಂದು ವ್ಯಾಖ್ಯಾನಿಸಲಾಗಿದೆ. ಈ ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದು ಸರಿಯಾದುದ್ದಲ್ಲ ?

(A) $gof(4) = 4$
(B) $fog(-4) = 4$
(C) $fog(2) = 2$
(D) $gof(-2) = 2$

57. $A = \{x \mid x \in \mathbb{N}, x \leq 5\}$, $B = \{x \mid x \in \mathbb{Z}, x^2 - 5x + 6 = 0\}$ ಆದಾಗ A ನಿಂದ B ಗೆ ಉಂಟಾಗುವ ಮೇಲಣ ಉತ್ಪನ್ನಗಳ ಸಂಖ್ಯೆಯು

(A) 2
(B) 23
(C) 30
(D) 32

58. ಧನಾತ್ಮಕ ಭಾಗಲಬ್ಧ ಸಂಖ್ಯೆಗಳ ಗಣದಲ್ಲಿ ದ್ವಿಮಾನಕ್ರಿಯೆ $*$ ನ್ನು $a * b = \frac{2ab}{5}$ ಎಂದು ವ್ಯಾಖ್ಯಾನಿಸಲಾಗಿದೆ. $2 * x = 3^{-1}$ ಆದರೆ, $x =$

(A) $\frac{1}{6}$
(B) $\frac{5}{12}$
(C) $\frac{2}{5}$
(D) $\frac{125}{48}$

59. $\cos\left[2\sin^{-1}\frac{3}{4} + \cos^{-1}\frac{3}{4}\right] =$

(A) $\frac{-3}{4}$
(B) $\frac{3}{4}$
(C) $\frac{3}{5}$
(D) does not exist

60. $a + \frac{\pi}{2} < 2\tan^{-1}x + 3\cot^{-1}x < b$ ಆದಾಗ 'a' ಮತ್ತು 'b' ಗಳು ಅನುಕ್ರಮವಾಗಿ

(A) 0 ಮತ್ತು π
(B) $\frac{\pi}{2}$ ಮತ್ತು 2π
(C) 0 ಮತ್ತು 2π
(D) $\frac{-\pi}{2}$ ಮತ್ತು $\frac{\pi}{2}$

Space For Rough Work

54. If $A = \begin{bmatrix} 1 & 3 \\ 4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -1 \\ 1 & 2 \end{bmatrix}$, then $|ABB'| =$

(A) 50
(B) –250
(C) 100
(D) 250

55. If the value of a third order determinant is 16, then the value of the determinant formed by replacing each of its elements by its cofactor is

(A) 96
(B) 48
(C) 256
(D) 16

56. $f : \mathbb{R} \to \mathbb{R}$ and $g : [0, \infty) \to \mathbb{R}$ is defined by $f(x) = x^2$ and $g(x) = \sqrt{x}$. Which one of the following is not true ?

(A) $gof(4) = 4$
(B) $fog(-4) = 4$
(C) $fog(2) = 2$
(D) $gof(-2) = 2$

57. If $A = \{x \mid x \in \mathbb{N}, x \leq 5\}$, $B = \{x \mid x \in \mathbb{Z}, x^2 - 5x + 6 = 0\}$, then the number of onto functions from A to B is

(A) 2
(B) 23
(C) 30
(D) 32

58. On the set of positive rationals, a binary operation $*$ is defined by $a * b = \frac{2ab}{5}$.

If $2 * x = 3^{-1}$ then $x =$

(A) $\frac{1}{6}$
(B) $\frac{5}{12}$
(C) $\frac{2}{5}$
(D) $\frac{125}{48}$

59. $\cos\left[2\sin^{-1}\frac{3}{4} + \cos^{-1}\frac{3}{4}\right] =$

(A) $\frac{-3}{4}$
(B) $\frac{3}{4}$
(C) $\frac{3}{5}$
(D) does not exist

60. If $a + \frac{\pi}{2} < 2\tan^{-1}x + 3\cot^{-1}x < b$ then 'a' and 'b' are respectively.

(A) 0 and π
(B) $\frac{\pi}{2}$ and 2π
(C) 0 and 2π
(D) $\frac{-\pi}{2}$ and $\frac{\pi}{2}$

Space For Rough Work

Space For Rough Work

Space For Rough Work

COMMON ENTRANCE TEST-2019

DATE	SUBJECT	TIME	QUESTION BOOKLET	
			VERSION CODE	SERIAL NUMBER
29-04-2019	MATHEMATICS	02.30 PM TO 03.50 PM	A-1	

Total Duration	Maximum Time for Answering	Maximum Marks	Total No. of Questions	Mention Your CET Number				
80 Minutes	70 Minutes	60	60					

DOs:

1. Candidate must verify that the CET number and Name printed on the OMR Answer Sheet is tallying with the CET Number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 2.30 pm.**
3. Candidate must verify that the Version Code of this Question Booklet is tallying with the Version code on the OMR Answer Sheet. Discrepancy if any, report to invigilator.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DONTs:

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The **3rd Bell rings at 2.40 pm, till then;**
   - Do not remove the seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet or start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains **60** questions and each question will have one statement and four distracters. (Four different options / responses.)
2. After the **3rd Bell is rung at 2.40 pm**, remove the paper seal on the right hand side of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced immedaitely by complete test booklet by showing it to Room Invigilator. Read each item and start answering on the OMR answer sheet.
3. During the subsequent **70** minutes :
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / responses) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   - Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen against the question number on the OMR answer sheet.**

4. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
6. After the **last bell is rung at 3.50 pm**, stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
7. Hand over the **OMR answer sheet** to the room invigilator as it is.
8. After separating the top sheet (KEA Copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year.**

NOTE : In case of any discrepancy between English and Kannada Versions, the English version will be taken as final.

Date : 22-MAY-19

COMMON ENTRANCE TEST - 2019

ANSWER KEYS - MATHS

Qno	A1
1	4
2	3
3	2
4	G
5	1
6	2
7	1
8	3
9	G
10	4
11	4
12	1
13	2
14	3
15	3
16	1
17	3
18	2
19	4
20	1
21	1
22	4
23	1
24	3
25	4
26	1
27	4
28	4
29	1
30	2
31	4
32	1
33	2
34	3
35	4
36	3
37	4
38	1
39	4
40	3
41	1
42	2
43	3
44	1
45	4
46	4
47	3
48	G
49	2
50	3
51	3
52	4
53	1
54	2
55	3
56	2
57	3
58	4
59	1
60	2

Note:

1. G - Indicates One GRACE MARK Awarded for the Question Number.
2. Value more than four indicates multiple answers are correct.

1. What is the function of Protein GLUT-4 ?
   (A) Acts as an enzyme.
   (B) Enables glucose transport into cells.
   (C) Fights infectious agents.
   (D) Functions as intercellular ground substance.

2. Cells in the quiescent stage (G_0)
   (A) always become cancerous
   (B) show indefinite proliferation.
   (C) remain metabolically inactive
   (D) remain metabolically active

3. Consider the following statements i, ii and iii regarding criteria for essentiality of the nutrients in plants :
   i. The presence of elements is must for plants to complete their life cycle.
   ii. The role of the element can be replaced by another element.
   iii. The element must be directly involved in the metabolism of the plant.

   Choose the correct statement/s :
   (A) i and iii
   (B) i and ii
   (C) iii only
   (D) ii and iii

4. During chemiosmotic synthesis of ATP in photosynthesis :
   (A) The protons accumulate in the intermembrane space of chloroplast.
   (B) The proton gradient is not required.
   (C) The protons accumulate in the intermembrane space of mitochondrion.
   (D) The protons accumulate within the lumen of the thylakoids.

5. When tripalmitin is used as respiratory substrate in aerobic respiration, the process consumes 145 molecules of Oxygen and releases 102 molecules of CO_2, then RQ value would be
   (A) 0.5
   (B) 0.7
   (C) 1.4
   (D) 1.0

Space For Rough Work

6. Identify the incorrect statement with reference of Biocontrol agents :

(A) They do not show any negative impact on crop plants.

(B) They help to increase the use of synthetic pesticides.

(C) They are significant in treating ecologically sensitive area.

(D) They do not affect non-target pests.

7. A Farmer has applied chemical fertilisers in his crop field for many successive seasons. In the next season, the crop growth was poor as soil lost its fertility. Suggest the suitable micro-organism that replenishes the fertility of soil in his field.

(A) Spirulina

(B) Nostoc

(C) Chlorella

(D) Spirogyra

8. In cloning vectors, antibiotic resistant genes are helpful for

(A) Transfer of foreign gene to the host

(B) Selection of recombinants

(C) Making the host cells competent

(D) Cleaving of vector by REN

9. A student while extracting DNA from Aspergillus fungus requires _____ enzyme to break open the cell wall.

(A) Cellulase

(B) Lysozyme

(C) Pectinase

(D) Chitinase

10. Identify the DNA sequence which can be cut using EcoRI.

(A) 5'TGCTTAAGTA3'
3'ACGAATTCAT5'

(B) 5'ACGAATTCAT3'
3'TGCTTAAGTA5'

(C) 5'TACTTAAGCA3'
3'ATGAATTCGT5'

(D) 3'ACGAATTCAT5'
5'TGCTTAAGTA3'

Space For Rough Work

11. Which of the following amino acids is coded by Single Codon ?

(A) Valine

(B) Phenylalanine

(C) Tyrosine

(D) Tryptophan

12. In Prokaryotes, the transcription of DNA is initiated with the help of

(A) Rho factor

(B) Elongation factor

(C) Sigma factor

(D) Termination factor

13. According to Human Genome Project (HGP), the total number of genes in human genome is estimated at 30,000, the number of genes present on Y-chromosome are

(A) 2968 genes

(B) 242 genes

(C) 231 genes

(D) 2898 genes

14. In a crime investigation, the investigating officer collects different biological samples from the crime spot for DNA Finger - Printing Analysis. Which of the following samples is not helpful in this analysis ?

(A) Skin Shreds

(B) Erythrocytes

(C) Semen Sample

(D) Hair Follicle

15. A mature mRNA consists of 900 bases without any stop codon in between. Calculate the number of amino acids coded by this mRNA during translation.

(A) 900

(B) 299

(C) 300

(D) 450

Space For Rough Work

16. Which one of the following ecosystem has the highest annual net primary productivity ?

(A) Desert

(B) Tropical deciduous forest

(C) Tropical rain forest

(D) Temperature evergreen forest

17. Of the total incident solar radiation the percentage Photosynthetically Active Radiation (PAR) captured by the plants

(A) 10 – 20% of PAR only

(B) 2 – 10% of PAR only

(C) 0 – 10% of PAR only

(D) 30 – 40% of PAR only

18. The historic convention related to conservation of biological diversity is also known as

(A) Earth Summit

(B) Kyoto Protocol

(C) World Summit

(D) Montreal Protocol

19. Which one of the following human activity has contributed to deforestation in north-eastern states of India ?

(A) Urbanisation

(B) Industrialisation

(C) Mono cropping

(D) Jhum cultivation

20. In an area where DDT has been used extensively, the population of birds declined significantly because –

(A) Birds became vulnerable to predators.

(B) Birds stopped laying eggs.

(C) Many of the eggs laid by birds showed pre-matured breaking.

(D) Earthworms in the area got eradicated.

21. The brain capacity of Homo habilis

(A) 1800 cc

(B) between 650 cc – 800 cc

(C) 900 cc

(D) 1400 cc

Space For Rough Work

22. In Bougainvillea and Cucurbita, the axillary bud is modified into thorn and tendril respectively. This is an example of

(A) Co-evolution

(B) Divergent Evolution

(C) Micro Evolution

(D) Convergent Evolution

23. Identify the incorrect statement.

(A) HIV is transmitted by mosquito bite.

(B) Pneumonia is a bacterial disease.

(C) Cancer is a non-infectious disease.

(D) Ringworm is a fungal disease.

24. A person shows symptoms like Sneezing, Watery eyes, running nose and difficulty in breathing, on exposure to certain substances in air. Which type of antibody is produced during such condition ?

(A) IgG

(B) IgE

(C) IgM

(D) IgA

25. A man was suffering from mental illness like depression and insomnia. Identify the drug which is normally used as medicine in such cases.

(A) Morphine

(B) Lysergic Acid Diethylamides (LSD)

(C) Nicotine

(D) Heroin

Space For Rough Work

26. Plants like Marchantia and Funaria produce gametes by mitosis, because

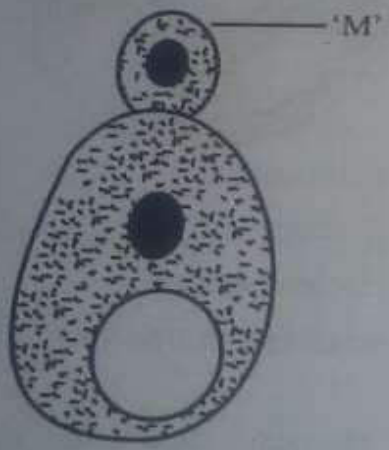
(A) They are gametophytes.

(B) Plant body is haploid.

(C) They are dioecious.

(D) Gametophyte is diploid.

27. Identify the asexual reproductive structure 'M' in the following diagram :



(A) Zoospore

(B) Bud

(C) Gemmule

(D) Conidium

28. In some plants, stigma and anther mature at different times because

(A) it attracts pollinators.

(B) it facilitates self pollination.

(C) it prevents cross pollination.

(D) it facilitates cross pollination.

29. Now-a-days agricultural practice is expensive to the farmers as they need to purchase hybrid seeds every year. Which of the following strategies can be employed to overcome this problem ?

(A) Synthetic seeds

(B) Production of Apomictic seeds

(C) Conventional plant breeding

(D) Parthenocarpy

Space For Rough Work

30. Identify the correct order of steps involved in Artificial hybridization in plants :

(A) Artificial pollination → Emasculation → Rebagging → Bagging

(B) Rebagging → Artificial pollination → Bagging → Emasculation

(C) Emasculation → Bagging → Artificial pollination → Rebagging

(D) Bagging → Artificial pollination → Rebagging → Emasculation

31. Which of the following protozoan parasites causes sleeping sickness ?

(A) Plasmodium

(B) Entamoeba

(C) Leishmania

(D) Trypanosoma

32. Which of the following phyla possess body cavity as shown in the diagram below ?

(A) Annelida

(B) Porifera

(C) Aschelminthes

(D) Coelenterata

33. Testa and Tegmen of the seed coat represent

(A) Dried Integuments

(B) Dried Sepals

(C) Dried Tepals

(D) Dried Petals

Space For Rough Work

34. The trees growing in temperature regions show clear demarcation between spring wood and autumn wood. This is because

(A) The climatic conditions are uniform throughout the year.

(B) The water stress is more.

(C) The temperature is high.

(D) The climatic conditions are not uniform throughout the year.

35. Identify the part labelled as 'M' in the diagram given below :

(A) Chromatid

(B) Kinetochore

(C) Centromere

(D) Satellite

36. Which of these is not an advantages in Genetically modified crops ?

(A) Increases efficiency of mineral usage in plants.

(B) Reduces the reliance on chemical pesticides.

(C) Enhances the nutritional value of food.

(D) Increases the post harvest losses

37. Some multinational companies have exploited the traditional knowledge of the indigenous people to produce commercially important bio products, without their consent. This is an example for

(A) Biopatent

(B) Bioprospecting

(C) Biopiracy

(D) Bioremediation

38. In Amphibians and reptiles, the body temperature changes corresponding to external temperature. The organisms which show this kind of response is termed as –

(A) Partial Regulators

(B) Regulators

(C) Thermophiles

(D) Conformers

Space For Rough Work

39. **Assertion (A) :** The Monarch butterfly feeds on poisonous weeds during its Caterpillars stage.

Reason (R) : It helps butterfly to become distasteful to its predator.

(A) (A) is true, (R) is false.

(B) (A) is true and (R) is its correct explanation.

(C) Both (A) and (R) are false.

(D) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

40. From the given options, identify the correct combination of population interactions that correspond to the symbols given here

++ −− +O

(A) Parasitism Competition Mutualism

(B) Predation Competition Commensalism

(C) Mutualism Competition Commensalism

(D) Mutualism Parasitism Amensalism

41. The nourishing cells in the Seminiferous tubules are

(A) Follicular cells

(B) Leydig cells

(C) Sertoli cells

(D) Spermatogonial cells

42. If in a normal Menstruating woman, menses occur on 5th April, what will be the expected date of Ovulation ?

(A) 10th April

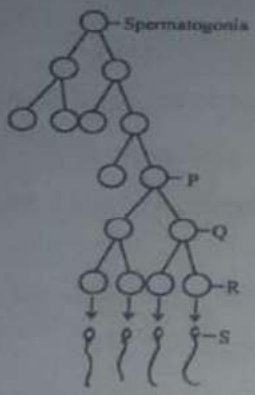
(B) 18th April

(C) 29th April

(D) 14th April

Space For Rough Work

43. Identify the cells represents as P, Q, R and S in the given schematic representation of spermatogenesis.



(A) P – Spermatozoa
Q – Spermatids
R – Secondary Spermatocyte
S – Primary Spermatocyte

(B) P – Primary Spermatocyte
Q – Secondary Spermatocyte
R – Spermatids
S – Spermatozoa

(C) P – Secondary Spermatocyte
Q – Spermatids
R – Spermatozoa
S – Primary Spermatocyte

(D) P – Secondary Spermatocyte
Q – Primary Spermatocyte
R – Spermatozoa
S – Spermatids

44. The method of natural contraception which requires correct knowledge of Menstrual cycle is

(A) Periodic Abstinence

(B) Lactational Amenorrhoea

(C) IUDs – Intrauterine Devices

(D) Coitus interrupts

45. A childless couple visit Assisted Reproductive Technologies (ARTs) centre to get assistance to have a child. On diagnosis, it was noticed that there was low sperm count in the male partner. Which of the following strategy of ART is most suitable in this case ?

(A) Gamete Intra-Fallopian Transfer (GIFT)

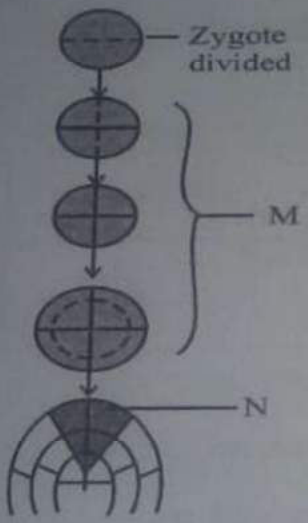
(B) Artificial Insemination (AI)

(C) Zygote Intra-Fallopian Transfer (ZIFT)

(D) In vitro Fertilisation (IVF)

Space For Rough Work

46. In the following diagrammatic representation showing stages of embryonic development, identify the type of growth phase labelled as M and N :



(A) M is geometric phase and N is arithmetic phase.

(B) Both M and N are arithmetic phases.

(C) M is arithmetic phase and N is geometric phase.

(D) Both M and N are geometric phases.

47. Indigestion of fats in humans may be an indication of

(A) Intestinal ulcers

(B) Under-secretion of saliva

(C) Inflammation of liver

(D) Under-secretion of amylopsin

48. Choose the correct statement from the following :

(A) Erythroblastosis foetalis may result when foetus is Rh^{-ve} and mother is Rh^{+ve}

(B) Histamine, Serotonin and Heparin are secreted by basophils.

(C) Atherosclerosis is often referred as anginapectoris.

(D) Person with blood group AB can donate blood to person with blood group A.

Space For Rough Work

49. In blind spot of the human eye

(A) Both cones and rods are absent.

(B) Only cones are absent.

(C) Both cones and rods are present.

(D) Only rods are absent.

50. A boy after attaining sexual maturity shows muscular growth, growth of facial and axillary hair, aggressiveness and low pitch of voice. These changes are attributed to _____ hormone.

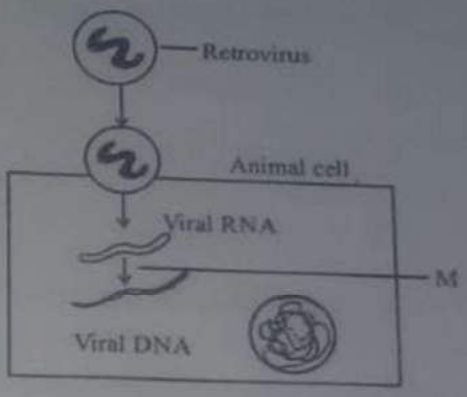
(A) Estrogen

(B) Testosterone

(C) Secretin

(D) Glucagon

51. Identify the enzyme that catalyses the step labelled as 'M' in the given Schematic representation of Replication of retrovirus.



(A) Reverse transcriptase

(B) RNA polymerase

(C) Recombinase

(D) DNA ligase

52. In animal breeding, the maximum genetic variations can be achieved through

(A) Inbreeding

(B) Outcrossing

(C) Interspecific hybridization

(D) Crossbreeding

Space For Rough Work

53. The oil content and quality of a groundnut variety was improved by plant breeding technique. This is an example of

(A) Bioremediation

(B) Biomagnification

(C) Biodegradation

(D) Biofortification

54. Microbes like Spirulina can be good alternate to the conventional sources of proteins for human nutrition, because ...

(A) their proteins are different from plant proteins.

(B) they give more biomass in less time.

(C) they have high fibre content.

(D) they are produced using synthetic fertilisers.

55. Consider the following morphological, biochemical or physiological characteristics of plants.

i. Presence of hairy leaves.

ii. Production of more nectar in flower.

iii. High sugar content in plant parts.

iv. Presence of higher aspartic acid concentration.

Choose the correct combination of statements which give natural resistance to plants against insect pests :

(A) iii and iv

(B) i and ii

(C) i and iv

(D) ii and iii

56. Identify the odd one among the following disorders :

(A) Haemophilia

(B) Sickle-cell Anaemia

(C) Phenyl Ketonuria

(D) Thalassemia

Space For Rough Work

57. From the Chromosomal Complements given below, identify the one which shows female heterogamety.

(A) XX – XO

(B) XX – XY

(C) XX – XXY

(D) ZZ – ZW

58. In Morgan's experiment with Drosophila, when yellow bodied white eyed female was crossed with brown bodied red eyed male and their F_1 progeny were intercrossed. What was the percentage of recombinants in F_2 generation ?

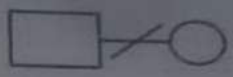
(A) 62.8%

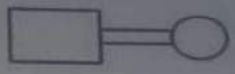
(B) 98.7%

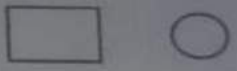
(C) 1.3%

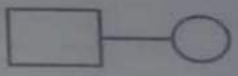
(D) 37.2%

59. In the following symbols, used in human pedigree Analysis, identify the symbol that denotes consanguineous mating.

(A) 

(B) 

(C) 

(D) 

60. Which of the following Nitrogen bases is found only in DNA ?

(A) Cytosine

(B) Adenine

(C) Thymine

(D) Guanine

Space For Rough Work

Date : 22-MAY-19

COMMON ENTRANCE TEST - 2019

ANSWER KEYS - BIOLOGY

Qnno	A1
1	2
2	4
3	4
4	1
5	1
6	4
7	1
8	3
9	2
10	4
11	2
12	4
13	3
14	2
15	2
16	2
17	4
18	2
19	1
20	4
21	1
22	1
23	1
24	2
25	1
26	1
27	1
28	3
29	1
30	1
31	1
32	2
33	3
34	2
35	1
36	3
37	4
38	2
39	1
40	4
41	3
42	4
43	1
44	3
45	1
46	3
47	2
48	4
49	1
50	4
51	4
52	1
53	1
54	3
55	1
56	1
57	1
58	2
59	1
60	4

Note:

1. G - Indicates One GRACE MARK Awarded for the Question Number.
2. Value more than four indicates multiple answers are correct.