


IIT
KALRASHUKLA
A Class Apart

CLASS – 11th (MEDICAL)

Time : 90 minutes

Maximum Marks : 180

:- Important Instructions :-

- (i) Use only Black Ball Point pen.
- (ii) This test booklet contains 4 Sections of question paper consisting of
SECTION - I → PHYSICS (10 Questions)
SECTION - II → CHEMISTRY (10 Questions)
SECTION - III → BIOLOGY (10 Questions)
SECTION - IV → MENTAL ABILITY & REASONING (15 Questions)
- (iii) Each question is allotted **4 marks for correct response**.
- (iv) **1 mark will be deducted** for marking incorrect or multiple responses.
- (v) No deduction will be made from total marks for unattempted questions.
- (vi) For each question, there is **only 1 correct** response.

Name of Student (in Capital Letter) : _____

Candidate Signature : _____

Invigilator Signature : _____

SECTION - I**PHYSICS**

1. In the situation shown in figure, the tension in the string connecting the two blocks will be (string is massless and frictional force is negligible)



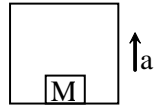
- (A) 20 N (B) 25 N (C) 10 N (D) 18 N
2. A body covers one-third of the distance with a speed v_1 , the second one-third of the distance with a speed v_2 and the remaining distance with a speed v_3 . The average speed is
- (A) $\frac{v_1 + v_2 + v_3}{3}$ (B) $\frac{3v_1v_2v_3}{v_1v_2 + v_2v_3 + v_3v_1}$
- (C) $\frac{v_1v_2 + v_2v_3 + v_3v_1}{3}$ (D) $\frac{v_1v_2v_3}{3}$
3. The velocity of projection of a particle if it does not rise more than 3 m in a range of 600 m is
- (A) 400 m/s (B) 273 m/s
- (C) 343 m/s (D) 3.83 m/s

Space for Rough Work

4. With what acceleration 'a' should the box of figure moves up so that the block of mass M exerts a force $7Mg/4$ on the floor of the box?

(A) $g/4$
(C) $3g/4$

(B) $g/2$
(D) $4g$



5. How much work must be done by a force on 100 kg body to accelerate it from 0 to 20 m/s in 20 s?

(A) 2×10^3 W
(C) 2×10^4 J

(B) 2×10^3 J
(D) 4×10^4 J

6. A sphere of mass m moving with a constant velocity u hits another stationary sphere of same mass. If e is the coefficient of restitution, the ratio of velocities of two spheres after collision is

(A) $\frac{1-e}{1+e}$

(B) $\frac{1+e}{e}$

(C) $\frac{e+1}{e-1}$

(D) $\frac{e-1}{e+1}$

Space for Rough Work

7. If moment of Inertia of a solid sphere about any axis passing through its center is I . Then find the moment of inertia of solid sphere about any tangent.
- (A) $\frac{7}{2}I$ (B) $\frac{2}{5}I$ (C) $\frac{2}{7}I$ (D) $\frac{5}{2}I$
8. The orbital speed of Jupiter is
- (A) greater than the orbital speed of earth (B) less than the orbital speed of earth
(C) equal to the orbital speed of earth (D) zero
9. A wire can be broken by applying a load of 20 kg wt. The force required to break the wire of twice the diameter is
- (A) 20 kg wt (B) 5 kg wt
(C) 80 kg wt (D) 160 kg wt
10. A cubical block of wood of specific gravity 0.5 and chunk of concrete of specific gravity 2.5 are fastened together. The ratio of the mass of wood to the mass of concrete which makes the combination to float with its entire volume submerged under water is
- (A) $\frac{3}{5}$ (B) $\frac{4}{5}$ (C) $\frac{3}{7}$ (D) $\frac{2}{7}$

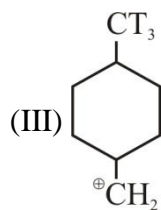
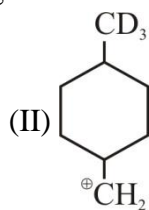
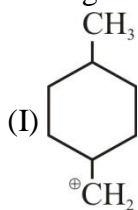
Space for Rough Work

SECTION - II**CHEMISTRY**

11. In the given reversible reaction $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$ According to Le-chatitier's principle if we increase the pressure of the reversible system then :
- (A) Concentration of all will increase
(B) Concentration of all will decrease
(C) Concentration of PCl_3 will decrease
(D) Concentration of PCl_5 will decrease
12. The oxidation number of sulphur(s) in $\text{Na}_2\text{S}_2\text{O}_3$ is :
- (A) 2 (B) 0, + 4
(C) -2, + 6 (D) 3, 3
13. In nature of π -bond in the compound XeOF_4 is
- (A) $3d_\pi - 2p_\pi$ (B) $5d_\pi - 2p_\pi$
(C) $4d_\pi - 2p_\pi$ (D) $4d_\pi - 3p_\pi$
14. According to Bohr's model of hydrogen atom the electric current generated due to motion of electron in n^{th} orbit is :
- (A) $\frac{4\pi^2 m k^2 e^4}{n^2 h^2}$ (B) $\frac{4\pi^2 m k^2 e^5}{n^2 h^2}$
(C) $\frac{n^2 h^2}{4\pi^2 m k^2 e^5}$ (D) $\frac{4\pi^2 m k^2 e^5}{n^3 h^3}$

Space for Rough Work

15. Arrange the following in the correct order of their stability.



(A) I = II = III

(B) III > II > I

(C) I > II > III

(D) I > III > II

16. The correct order of solubility of sulphates of alkaline earth metals are

(A) $\text{BeSO}_4 > \text{MgSO}_4 > \text{SrSO}_4 > \text{CaSO}_4$

(B) $\text{BeSO}_4 > \text{MgSO}_4 > \text{CaSO}_4 > \text{SrSO}_4$

(C) $\text{BeSO}_4 > \text{MgSO}_4 < \text{CaSO}_4 < \text{SrSO}_4$

(D) $\text{MgSO}_4 < \text{CaSO}_4 < \text{SrSO}_4 > \text{BeSO}_4$

17. The percentage of degree of dissociation of 0.033 M NH_4OH at 25°C in a solution of $\text{pH} = 11$ is _____.

(A) 3%

(B) 100%

(C) 20%

(D) 6%

Space for Rough Work

18.

| Column – I | | Column – II | |
|------------|---|-------------|------------------------|
| P | $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10 \text{H}_2\text{O}$ | 1 | -O- linkage present |
| Q | $\text{S}_2\text{O}_8^{2-}$ | 2 | -O-O- linkage present |
| R | B_2H_6 | 3 | $3c-4e^-$ bond present |
| S | Al_2Cl_6 | 4 | $3c-2e^-$ bond present |

(A) P-2, Q-1, R- 4, S-3
(C) P-1, Q-2, R- 3, S-4

(B) P-1, Q-2, R- 4, S-3
(D) P-2, Q-1, R- 3, S-4

19. Two glass bulb A and B are connected by a very small tube (of negligible volume) having stop cock. Bulb A has a volume of 100 cm^3 and contains certain gas while bulb B is empty. On opening the stop cock, the pressure in 'A' fell down by 60%. The volume of bulb B must be

- (A) 200 mL
(C) 250 mL
- (B) 150 mL
(D) 100 mL

20. Which one of the following pairs of elements has the second element with greater first ionization energy?

- (A) P, As
(C) Al, Ga
- (B) Si, Ge
(D) S, Se

Space for Rough Work

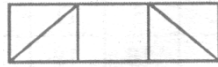
SECTION - III**BIOLOGY**

21. In bacteria, plasmid is
(A) Extra chromosomal material (B) Main DNA
(C) Non-functional DNA (D) Repetitive gene
22. The sexual reproduction is absent in
(A) Spirogyra (B) Nostoc (C) Ulothrix (D) Volvox
23. Which one of the following is not a characteristic of phylum Annelida?
(A) Pseudocoelom (B) Ventral nerve cord
(C) Closed circulatory system (D) Segmentation
24. An example of edible underground stem is
(A) Carrot (B) Groundnut (C) Sweet potato (D) Potato
25. Which of the following structure is not found in a prokaryotic cell?
(A) Mesosome (B) Plasma membrane
(C) Nuclear envelope (D) Ribosome
26. Emulsification of fat is carried out by
(A) Bile pigments (B) Bile salts (C) HCl (D) Pancreatic juice
27. Lungs are enclosed in
(A) Periosteum (B) Perichondrium
(C) Pericardium (D) Pleural membrane
28. 'Bundle of His' is a part of which one of the following organs in humans?
(A) Brain (B) Heart (C) Kidney (D) Pancreas
29. In ureotelic animals, urea is formed by
(A) Krebs cycle (B) EM pathway (C) Ornithine cycle (D) Cori's cycle
30. Intercostal muscles occur in
(A) Abdomen (B) Thigh (C) Ribs (D) Diaphragm

Space for Rough Work

SECTION -IV**MENTAL ABILITY & REASONING**

31. How many quadrilaterals are there in the following figure ?



- (A) 11 (B) 8 (C) 2 (D) 4
32. Find the wrong term -
9, 11, 15, 23, 39, 70, 135
(A) 23 (B) 39 (C) 70 (D) 135
33. A watch reads 4 : 30. If the minute - hand points to East, in which direction does the hour-hand point ?
(A) North-East (B) South-East (C) North-West (D) North
34. The time in the clock is 4 : 46, what is the mirror image ?
(A) 7 : 24 (B) 7 : 14 (C) 7 : 14 (D) 7 : 24
35. Neelam, who is Rohit's daughter, says to Indu, "Your mother Reeta is the younger sister of my father, who is the third child of Sohanji. " How is Sohanji related to Indu ?
(A) Maternal-uncle (B) Grandfather
(C) Father (D) Father-in-law

Space for Rough Work

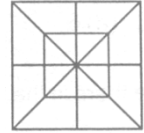
36. If the seventh day of month is three days earlier than Friday, what day will it be one the nineteenth day of the month ?
(A) Sunday (B) Monday (C) Wednesday (D) Friday
37. Sum of the Proper divisors of 100.
(A) 217 (B) 216 (C) 116 (D) 117
38. Sanjay went 70 metres in the East before turning to his right. He went 10 metres before turning to his right again and went 10 metres from this point. From here he went 90 metres to the North. How far was he from the starting point ?
(A) 80 metres (B) 100 metres (C) 140 metres (D) 260 metres
39. If **RAT** = 42 and **CAT** = 57, then **LATE** = ?
(A) 60 (B) 70 (C) 64 (D) 74
-

Space for Rough Work

Direction 40: Which sequence of letter when placed at the blanks one after the other will complete the given letter series ?

40. abc_d_bc_d_db_cda
(A) bacdc (B) cdabc (C) dacab (D) dccbd

41. Count the number of triangles and squares in the following figure ?
(A) 28 triangles, 10 squares
(B) 28 triangles, 8 squares
(C) 32 triangles, 10 squares
(D) 32 triangles, 8 squares.



Direction 42 : Six friends are sitting around a circular table at equal distances from each other. Ramola is sitting two places right of Komolika who is exactly opposite to Anu. Anu is sitting on the immediate left of Pallavi, who is exactly opposite to Mandira, natasha is also sitting at the table.

42. Which of the following statements is not correct ?
(A) Natasha and Ramola are exactly apposite to each other.
(B) Mandira and Natasha are at equal distance from Komolika.
(C) Angle subtended by Manidra and Natasha is same at the angle subtended by Ramola and Pallavi at the centre of the table.
(D) Natasha is on the immediate left of Pallavi.

Space for Rough Work

