

**PRABAL TEST PAPER**

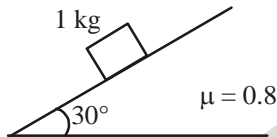
Time : 1 : 00 Hr.

Question : 50

**PHYSICS**

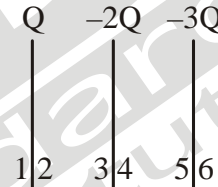
01. A ball of mass 0.15 kg is dropped from a height 5 m, strikes the ground and rebounds to the same height. The magnitude of impulse imparted to the ball is ( $g = 10 \text{ m/s}^2$ ) nearly
- (1) 1 kg m/s                      (2) 2 kg m/s  
(3) 3 kg m/s                      (4) none of these

02. If  $g = 10 \text{ ms}^{-2}$ , the frictional force on block is

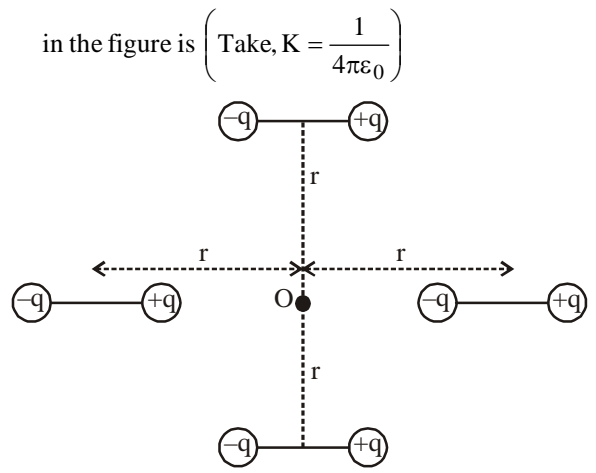


- (1) 6 N  
(2) 8 N  
(3) 5 N  
(4) none of these
03. A person is standing in elevator. In which situation he finds his weight more.
- (1) When the elevator moves upward with constant acceleration  
(2) When the elevator moves downwards with constant acceleration.  
(3) When the elevator moves upward with uniform velocity.  
(4) When the elevator moves downward with uniform velocity.
04. A wheel having moment of inertia  $2 \text{ kg-m}^2$  about its vertical axis, rotates at the rate of 60 rpm about an axis. The torque which can stop the wheel's rotation in one minute would be :
- (1)  $\frac{\pi}{12} \text{ N-m}$                       (2)  $\frac{\pi}{15} \text{ N-m}$   
(3)  $\frac{\pi}{18} \text{ N-m}$                       (4)  $\frac{2\pi}{15} \text{ N-m}$

05. Consider two uniform discs of the same thickness and different radii  $R_1 = R$  and  $R_2 = \alpha R$  made of the same material. If the ratio of their moment of inertia  $I_1$  and  $I_2$ , respectively, about their axes is  $I_1 : I_2 = 1 : 16$  then the value of  $\alpha$  is
- (1) 2      (2) 4      (3)  $2\sqrt{2}$       (4)  $\sqrt{2}$
06. For the system of three large parallel conducting plates. Find ratio of charge on surface 1( $q_1$ ) and surface 4( $q_4$ )



- (1) -2      (2) -5      (3) -3/2      (4) +3/2
07. Two pith balls having charges  $3q$  and  $2q$  are placed at a distance of  $a$  from each other. For what value of charge transferred from 1st ball to 2nd ball, force between balls become maximum ?
- (1)  $\frac{q}{2}$       (2)  $\frac{5q}{2}$       (3)  $7q$       (4)  $q$
08. Net electric field at the given point O due to four identical short electric dipoles of dipole moment  $p$  each as shown

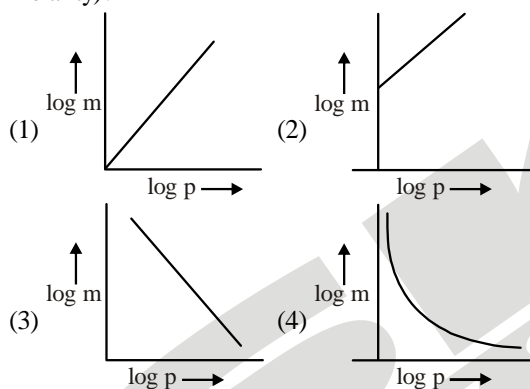


- in the figure is (Take,  $K = \frac{1}{4\pi\epsilon_0}$ )
- (1)  $\frac{Kp}{r^3}$       (2)  $\frac{2Kp}{r^3}$       (3)  $\frac{Kp}{2r^3}$       (4)  $\frac{4Kp}{r^3}$

09. In a compound microscope, the focal lengths of two lenses are 1.5 cm and 6.25 cm and an object is placed at 2 cm from objective and the final image is formed at 25 cm from eye lens. The distance between the two lenses is:
- (1) 6.00 cm (2) 7.75 cm  
(3) 9.25 cm (4) 11.00 cm
10. Pick the wrong answer in the context with rainbow.
- (1) When the light rays undergo two internal reflections in a water drop, a secondary rainbow is formed  
(2) The order of colours is reversed in the secondary rainbow  
(3) An observer can see a rainbow when his front is towards the sun  
(4) Rainbow is a combined effect of dispersion refraction and reflection of sunlight

## CHEMISTRY

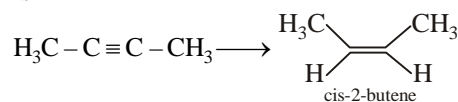
11. Which of the following curves represents the Henry's law (where,  $K_H$  is in the unit of bar molal<sup>-1</sup> and  $m$  is the molality)?



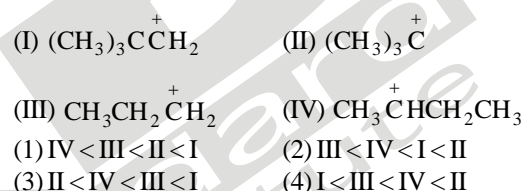
12.  $x$  g of urea in 90 g water shows same lowering of vapour pressure as 18 g of glucose in 90 g of water. Thus,  $x$  is
- (1) 18 g (2) 9 g (3) 6 g (4) 4 g
13. 6 g of urea was dissolved in 9.9 moles of  $H_2O$ . This vapour pressure falls by
- (1) 10% (2) 6.0% (3) 9.0% (4) 1.0%
14. Which of the given aqueous solutions has maximum boiling point
- (1) 18% glucose solution by weight of solution  
(2) 34.2% sucrose solution by weight of solution  
(3) 6% urea solution by weight of solution  
(4) All have equal boiling points
15. The freezing point of equilibrium solution in aqueous medium will be highest for
- (1)  $C_6H_5NH_3Cl$  (2)  $C_6H_{12}O_6$   
(3)  $La(NH_3)_3$  (4)  $Ca(NO_3)_2$

16. Which one is the correct order of acidity?
- (1)  $HC \equiv CH > CH_3 - C \equiv CH > H_2C = CH_2 > CH_3 - CH_3$   
(2)  $HC \equiv CH > H_2C = CH_2 > CH_3 - C \equiv CH > CH_3 - CH_3$   
(3)  $H_3C - CH_3 > H_2C = CH_2 > CH_3 - C \equiv CH > HC \equiv CH$   
(4)  $H_2C = CH_2 > CH_3 - CH = CH_2 > CH_3 - C \equiv CH > HC \equiv CH$

17. The most suitable reagent for the following conversion is



- (1) Na/liquid  $NH_3$  (2)  $H_2$ , Pd/C, quinoline  
(3) Zn/HCl (4)  $Hg^{2+} / H^+$ ,  $H_2O$
18. Which of the following is correct with respect to  $-I$  effect of the substituents? ( $R = \text{alkyl}$ )
- (1)  $-NH_2 < -OR < -F$  (2)  $-NO_2 < -OR < -F$   
(3)  $-NH_2 > -OR > -F$  (4)  $-NR_2 < -OR > -F$
19. Arrange the following carbocations in order of increasing stability:

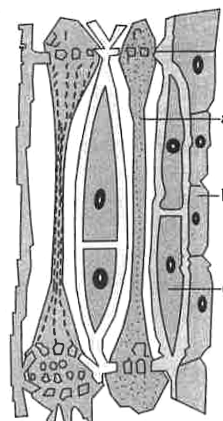


20. The stability of the following carbocation decreases in the order:



## BOTANY

21. Recognise the figure and find out the incorrect option.



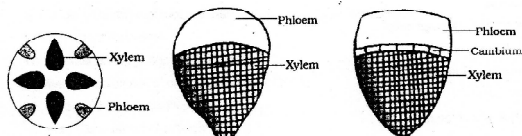
- (1) On maturation 'a' possesses a peripheral cytoplasm and large vacuole but lacks a nucleus

- (2) 'b' stores food material in the form of starch or fat, and other substances like tannins  
 (3) 'c' helps in the maintaining the pressure gradient in 'a'  
 (4) 'a' and 'c' are not found in pteridophytes and gymnosperms. They have albuminous cells and sieve cells

22. Find out the mismatch pair.

- (1) Tracheids—Elongated or tube like cells with thick and lignified walls. These are dead and without protoplast  
 (2) Vessels—Tube like structure made up of many cells called vessel members, each with lignified walls and a large central cavity. These are devoid of protoplasm  
 (3) Xylem fibres—Highly thickened walls and obliterated central lumens  
 (4) Xylem parenchyma—Living and thin walled cellulosic cells. They store food materials in the form of resin, latex and mucilage

23.



What type of vascular bundles are A, B and C?

- (1) Radial, close collateral conjoint; open collateral conjoint  
 (2) Close collateral conjoint; open collateral conjoint, Radial  
 (3) Open collateral conjoint; Close collateral conjoint; Radial  
 (4) Bicollateral; Concentric; Radial

24. During callus differentiation which of the cells divide?

- (1) Parenchyma only (2) Meristematic only  
 (3) Both (1) and (2) (4) No division

25. Which among the structure has an elongated, unbranched, pointed, and needle-like apices?

- (1) Phloem parenchyma (2) Phloem fibre  
 (3) Companion cells (4) Sieve tubes

26. I. Cells like heart cells and nerve cells, which are also called non-dividing cells are in phase.

II. During S-phase in animal cells, DNA replication takes place in the ...B... and duplication of centriole takes place in the ...B....

Fill in the blanks with appropriate options.

- (1) A—G<sub>0</sub>, B—nucleus, C—cytoplasm  
 (2) A—S, B—cytoplasm, C—nucleus  
 (3) A—G<sub>1</sub>, B—nucleus, C—cytoplasm  
 (4) A—G<sub>1</sub>, B—cytoplasm, C—nucleus

27. In diploid organism, phenomenon of crossing over is responsible for

- (1) linkages between genes  
 (2) recombination between homologous genes  
 (3) segregation between genes  
 (4) dominance of gene

28. In which of the following ways are mitosis and meiosis similar?

- (1) Both have pairing of homologous chromosomes.  
 (2) Both are preceded by DNA replication.  
 (3) Both occur in all kinds of cells.  
 (4) Both include separation of paired chromosomes.

29. What happens to a cell after M phase of cell cycle?

- (1) Nucleocytoplasmic index decreases.  
 (2) Nucleocytoplasmic index increases.  
 (3) Nucleocytoplasmic index fluctuates.  
 (4) Nucleocytoplasmic index remains constant.

30. In Spermatogenesis of human beings, how many bivalents undergo recombination and crossing over?

- (1) Half of total bivalents  
 (2) All homologous chromosome pairs  
 (3) All tetrads in a cell  
 (4) All but sex chromosome

31. Read the following statements carefully:

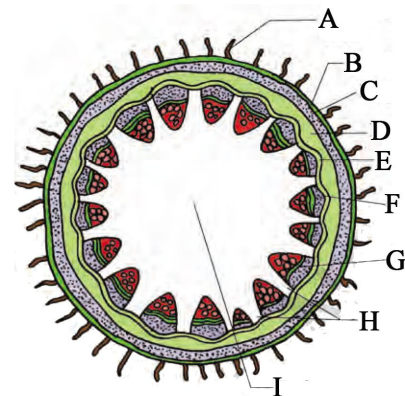
- a. The cells of the permanent tissues do not generally divide further  
 b. Permanent tissues having many different types of cells are called simple tissues.

c. Permanent tissues having all cells similar in structure and function are called complex tissues.

Among these statements,

- (1) a and b are correct but c is incorrect  
 (2) b and c are correct but a is incorrect  
 (3) a and c are incorrect but b is correct  
 (4) b and c are incorrect but a is correct

32. T.S. of dicot stem is given below, certain parts have been indicated by alphabets. Choose the answer in which these alphabets have been correctly matched with the parts which they indicate



(1) A= Epidermis, B=Epidermal hairs, C=Parenchyma, D=Starch sheath E=Hypodermis (collenchyma), F= Vascular bundle, G= Bundle cap, H=Medulla or pith, I=Medullary rays

(2) A= Epidermal hairs, B=Epidermis C=Hypodermis (Collenchyma), D=Parenchyma, E=Starch sheath, F=Bundle cap, G=Vascular bundle, H=Medullary rays, I=Medulla or pith.

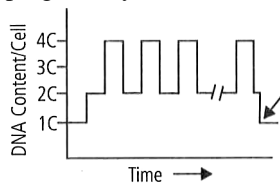
(3) A=Epidermal hairs, B=Epidermis, C=Hypodermis (collenchyma), D=Starch sheath, E=Parenchyma,

F=Vascular bundle, G=Bundle cap, H=Medulla or pith, I=Medullary rays.

(4) A= Epidermal hairs, B=Epidermis C=Parenchyma D=Hypodermis (collenchyma) E= Starch sheath, F= Vascular bundle G=Bundle cap, H=Medulla or pith I= Medullary rays

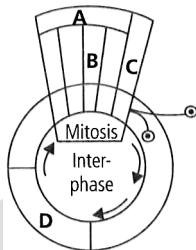
33. How many of the following tissues given below are formed by dedifferentiation?  
[intra-fascicular cambium, inter-fascicular cambium, cork cambium, procambium, phelloderm]  
(1) Three (2) Two (3) Four (4) Five

34. Given diagram shows variations in the amount of DNA of a developing eukaryote. What the arrow denotes?



- (1) First meiotic anaphase 3  
(2) Second meiotic anaphase  
(3) Mitotic anaphase  
(4) Mitotic telophase

35. The given figure is a schematic break-up of the phases/stages of cell cycle. Select the correct option regarding it.



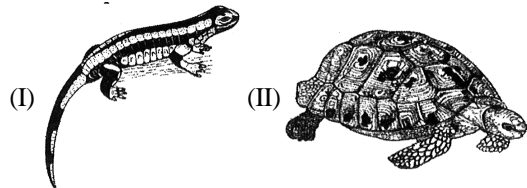
- (1) 'A' represents karyokinesis which is the division of cytoplasm.  
(2) 'B' is telophase which is just reverse of prophase.  
(3) 'C' is the best phase to count total number of chromosomes in any species.  
(4) In 'D' stage, replication of DNA takes place on the template of the existing DNA

## ZOOLOGY

36. Which set has the two members of the same phylum?  
(1) Cuttle fish and jelly fish  
(2) Tapeworm and earthworm  
(3) Dog fish and dolphin  
(4) Sea hare and sea lily
37. Which of the following bony fish found in fresh water?  
(1) Hippocampus (2) Exocoetus  
(3) Catla (4) Carcharodon

38. Skin is dry without glands except the oil gland at the base of the tail is a character of?  
(1) Amphibia (2) Aves (3) Reptiles (4) Fish

39. Which of the following options is correct for I and II animals regarding their name and their respective taxa?



- (1) I-Salamandra – Reptilia; II-Chelone – Amphibia  
(2) I-Chameleon – Reptilia; II-Chelone – Reptilia  
(3) I-Salamandra – Amphibia; II-Chelone – Amphibia  
(4) I-Salamandra – Amphibia; II-Chelone- Reptilia

40. Match the animals in Column I with their character in Column II.

	Column-I		Column-II
(A)	Chameleon	(i)	Crow
(B)	Hemidactylus	(ii)	Pigeon
(C)	Corvus	(iii)	Garden lizard
(D)	Columba	(iv)	Tree lizard
(E)	Calotes	(v)	Wall lizard

- (1) A-(iv), B-(v), C-(iii), D-(ii), E-(i)  
(2) A-(iv), B-(v), C-(i), D-(ii), E-(iii)  
(3) A-(iv), B-(v), C-(i), D-(iii), E-(ii)  
(4) A-(ii), B-(v), C-(iv), D-(iii), E-(i)

41. Identify the correct statement:

- (1) The juxtaglomerular cells of kidney produce a steroid hormone  
(2) Gastrin stimulates, the secretion of HCl and pepsinogen  
(3) Secretin acts on endocrine pancreas and stimulates secretion of  $H_2O$  and  $HCO_3^-$   
(4) Glucagon is a hypoglycemic hormone

42. In a pregnant woman having prolonged labour pains, to aid parturition, it is advisable to administer a hormone that can:

- (1) Activate the smooth muscles contraction  
(2) Increase the secretion of ADH  
(3) Releases glucose into the urine  
(4) None of the above

43. Which is true of thyrocalcitonin?

- (1) Produced by parathyroid, decreases Ca in blood  
(2) Produced by thyroid, decreases Ca in blood  
(3) Produced by parathyroid, increases Ca in blood  
(4) Produced by thyroid, increases Ca in blood

44. The pneumotaxic and the respiratory rhythm centres are respectively present in:

- (1) Pons and medulla oblongata  
(2) Corpus callosum and pons  
(3) Medulla oblongata and pons  
(4) Diencephalon and pons

45. Match the columns:

	Column-I		Column-II
1.	Tidal volume	a.	2500–3000 ml of air
2.	Inspiratory reserve volume	b.	1000 ml of air
3.	Expiratory reserve volume	c.	500 ml of air
4.	Residual volume	d.	3400–4800 ml of air
5.	Vital capacity	e.	1200 ml of air

- (1) 1–c, 2–d, 3–b, 4–a, 5–e  
(2) 1–c, 2–a, 3–b, 4–e, 5–d  
(3) 1–e, 2–a, 3–d, 4–e, 5–d  
(4) 1–d, 2–a, 3–b, 4–e, 5–d

46. Choose the correct option.

- (a) Flame cells are excretory structures in flatworms.  
(b) Green glands are excretory organs in crustaceans.  
(c) Columns of Bertini are conical projections of renal pelvis into renal medulla between renal pyramids.  
(1) (b) and (c)                      (2) (a) and (b)  
(3) (a) and (c)                      (4) All of these

47. Mark the incorrect statement with respect to the collecting duct.

- (1) It does not allow passage of small amount of urea into the medullary interstitium  
(2) It has no role in the maintenance of osmolarity of interstitial fluid  
(3) It is present in cortex part only  
(4) All of these

48. Atrial natriuretic factor (ANF) opposes

- (1) regulation by RAAS  
(2) action of adrenaline  
(3) action of glucocorticoids  
(4) action of erythropoietin

49. Oxygen haemoglobin dissociation curve shifts to the right on decrease of:

- (1) Acidity  
(2) Carbon dioxide concentration  
(3) Temperature  
(4) pH

50. Amount of oxygen present in one gram of haemoglobin is:

- (1) 20 mL                              (2) 1.34 mL  
(3) 13.4 mL                            (4) None of the above