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PRABAL TEST PAPER

Time : 1 : 00 Hr. **Question : 50**

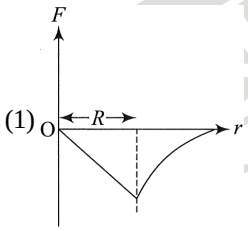
PHYSICS

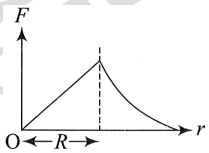
01. The angle between two forces of equal magnitude 5N acting on a particle is 74°. Find their resultant.
(1) 8 N (2) 10 N
(3) 6 N (4) None of these

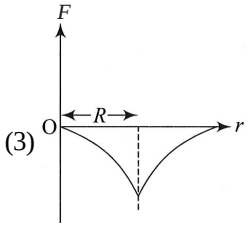
02. To a person sitting in a car moving east at $2\sqrt{3}$ ms^{-1}, a bird appears flying north at 2 ms^{-1}. Find actual velocity of bird.
(1) 4 ms^{-1} at 60° E of N
(2) 4 ms^{-1} at 60° W of N
(3) 4 ms^{-1} at 30° E of N
(4) 4 ms^{-1} at 30° W of N

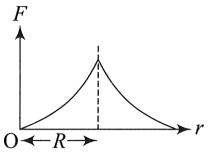
03. Relation between time period of two satellites is $T_A = 2T_B$. Find ratio between radii of orbits
(1) $4^{1/3}$ (2) $2^{1/3}$
(3) $3^{1/3}$ (4) $4^{2/3}$

04. Dependence of intensity of gravitational field (F) of earth with distance (r) from centre of earth is correctly represented by

(1) 

(2) 

(3) 

(4) 

05. Two astronauts are floating in gravitational free space after having lost contact with their spaceship. The two will:
(1) Move towards each other
(2) Move away from each other
(3) Will become stationary
(4) Keep floating at the same distance between them

06. A tank full of water has a small hole at its bottom. Let t_1 be the time taken to empty first one third of the tank and t_2 be the time taken to empty second one third of the tank and t_3 be the time taken to empty rest of the tank then
(1) $t_1 = t_2 = t_3$ (2) $t_1 > t_2 > t_3$
(3) $t_1 < t_2 < t_3$ (4) $t_1 > t_2 < t_3$

07. Two small spherical drops having radii in the ratio 1 : 2 fall from a great height through the atmosphere. Their kinetic energy on reaching the earth are in the ratio:
(1) 1 : 128 (2) 1 : 8
(3) 1 : 16 (4) 1 : 32

08. An object 5 cm tall is placed 1m from a concave spherical mirror which has a radius of curvature of 40 cm The size of the image is :
(1) 1.25 cm (2) 0.50 cm
(3) 0.55 cm (4) None of these

09. A ray of light passes from vacuum into a medium of refractive index n. If the angle of refraction is twice the angle of incidence, then the angle of incidence is:
(1) $\cos^{-1}(n/2)$ (2) $\sin^{-1}(n/2)$
(3) $2\cos^{-1}(n/2)$ (4) $\cos^{-1}(1/2n)$

10. A bulb is located on a wall, its image of equal size is to be obtained on a parallel wall with the help of convex lens. If walls are separated by d, then required focal length will be :
(1) only $\frac{d}{4}$ (2) only $\frac{d}{2}$

(3) more than $\frac{d}{4}$ but less than $\frac{d}{2}$

(4) less than $\frac{d}{4}$.

CHEMISTRY

11. Vapour pressure of a pure liquid X is 2 atm at 300 K. It is lowered to 1 atm on dissolving 1 g of Y in 20 g of liquid X. If molar mass of X is 200, what is the molar mass of Y?
(1) 20 (2) 50
(3) 100 (4) 200

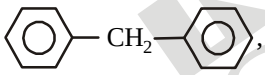
12. Which of the following has the highest freezing point?
(1) 1 m NaCl solution (2) 1 m KCl solution
(3) 1 m $AlCl_3$ solution (4) 1 m $C_6H_{12}O_6$ solution

13. H_2S is a toxic gas used in qualitative analysis. If solubility of H_2S in water at STP is 0.195 m, what is the value of K_H?
(1) 0.0263 bar (2) 69.16 bar
(3) 192 bar (4) 282 bar

14. Osmotic pressure of a solution containing 2 g dissolved protein per 300 cm^3 of solution is 20 mm of Hg at 27°C. The molecular mass of protein is
(1) 6239.6 g mol^{-1} (2) 12315.5 g mol^{-1}
(3) 3692.1 g mol^{-1} (4) 7368.4 g mol^{-1}

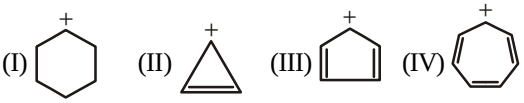
15. 1 g of a non-volatile non-electrolyte solute is dissolved in 100 g of two different solvents A and B whose ebullioscopic constants are in the ratio of 1 : 5. The ratio of the elevation in their boiling points, $\frac{\Delta T_b(A)}{\Delta T_b(B)}$, is?
(1) 5 : 1 (2) 1 : 0.2
(3) 10 : 1 (4) 1 : 5

16. The molecular formula of diphenylmethane,

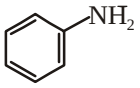


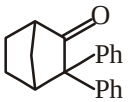
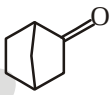
, is $C_{13}H_{12}$;
How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom?
(1) 4 (2) 6
(3) 7 (4) 8

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

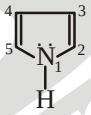


(1) IV > III > II > I (2) IV > II > III > I
(3) IV > II > I > III (4) IV > I > II > III

18. Which of the following is the strongest base?
(1)  (2) 
(3)  (4) 

19. Which among the given molecules can exhibit tautomerism?
I.  II.  III. 
(1) III only (2) Both I and II
(3) Both I and III (4) Both II and III

20. In pyrrole the electron density is maximum on:



(1) 2 and 3 (2) 2 and 4
(3) 2 and 5 (4) 3 and 4

BOTANY

21. There is no transfer of electrons from cyt b to cyt c as
(1) Energy is not available
(2) The two are not nearby
(3) Electrons are transported in paris
(4) Electrons have no affinity for cytochromes

22. Which is the correct chemical formula of tripalmitin ?
(1) $C_{16}H_{32}O_2$ (2) $C_{54}H_{108}O_2$
(3) $C_{32}H_{64}O_4$ (4) $C_{51}H_{98}O_6$

23. Electron transport requires
(1) Cytochromes (2) Phytochrome
(3) Enzymes (4) Hormones

24. Terminal cytochrome of respiratory chain which donates electrons to oxygen is
(1) Cyt b (2) Cyt c
(3) Cyt a_1 (4) Cyt a_3

25. Hexokinase use…….. as substrate-
(1) fructose
(2) glucose
(3) both 1 and 2
(4) none of the above

26. Which of the following enzyme not located in cytoplasm-
(1) hexokinase
(2) pyruvate kinase
(3) triose phosphate isomerase
(4) succinate dehydrogenase

27. Consider the following statement-
(a) Pyruvate kinase enzyme is last enzyme in EMP pathway
(b) Complex III is also named as cyt c oxidase complex
How many correct-
(1) only a (2) only b
(3) both correct (4) both wrong

28. During glycolysis the number of ATP molecules utilised to change glucose into fructose 1, 6 Bisphosphate are
(1) 4 (2) 3
(3) 2 (4) 1

29. The net gain of energy from one gram mole of glucose during aerobic respiration is
(1) 2 ATP (2) 4 ATP
(3) 38 ATP (4) 40 ATP

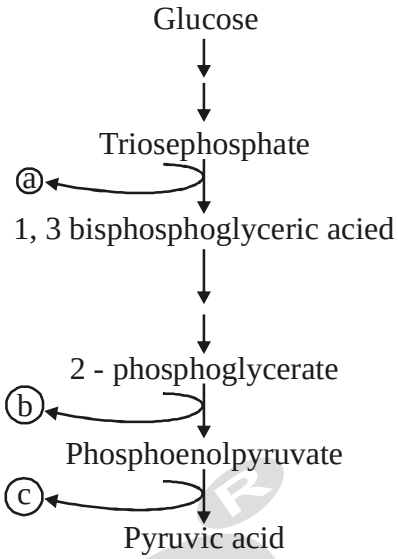
30. Assertion: Plants do not present great demands for gas exchange.
Reason: Only during photosynthesis large volumes of gaseous exchange required in plants.
(A) Assertion and reason both are true and the reason is correct explanation of assertion.
(B) Assertion and reason both are true but reason is not correct explanation of assertion.
(C) Assertion is true but reason is wrong.
(D) Assertion and reason both are wrong.

31. Cytochrome c is a small protein attached to the
(1) Outer surface of the inner membrane
(2) Inner surface of the outer membrane
(3) Inner surface of the inner membrane
(4) Outer surface of the outer membrane

32. Consider the following statement-
(a) During ATP synthesis, low PH in intermembrane space
(b) In ETS oxidation of FADH2 not involve FMN
How many correct-
(1) only a (2) only b
(3) both correct (4) both wrong

33. Condensation of OAA occur with acetyl CoA and …….. in first step of kreb cycle in which citrate form
(1) Water (2) Acetic acid
(3) citrate synthetase (4) isocitrate

34. Recognise the figure and findout the correct matching



(1) a-ATP, b-NADH, c -H_2O
(2) a-H_2O, b-NADH, c-ATP
(3) a-NADH, b-H_2O, c-ATP
(4) a-H_2O, b-ATP, c-NADH

35. General formula for aerobic respiration is
(1) $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
(2) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 686$ kcal
(3) $C_6H_{12}O_6 + 2C_2H_5OH + 2CO_2 + 2ATP$
(4) $C_6H_{12}O_6 \rightarrow 2C_3H_6O_3 + 2ATP$

ZOOLOGY

36. Select the correct option

	Structure	%	Function
(1)		0.3-0.5	Phagocytic
(2)		0.5-1	Secret histamine and serotonin
(3)		30-40	Defence against microbes
(4)		30-40	Allergic reactions

37. Read the following statement (A-D)
(A) Artery always carry blood from heart to the organs
(B) Valves are absent in the arteries
(C) Artery always carry oxygenated blood
(D) Lumen of artery is wide
How many statements are wrong?
(1) Three (2) Four
(3) One (4) Two

38. Which one of the following statements is correct regarding blood pressure?
(1) 130/90 mm Hg is considered high and requires treatment
(2) 100/55 mm Hg is considered an ideal blood pressure
(3) 190/50 mm Hg makes one very active
(4) 190/110 mm Hg may harm vital organs like brain and kidney

39. Which of the following statements are correct ?
A. Basophils are most abundant cells of the total WBCs
B. Basophils secrete histamine, serotonin and heparin
C. Basophils are involved in inflammatory response
D. Basophils have kidney shaped nucleus
E. Basophils are agranulocytes
Choose the correct answer from the options given below:
(1) C and E only (2) B and C only
(3) A and B only (4) D and E only

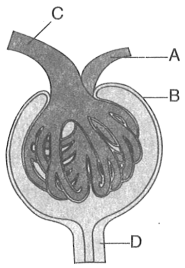
40. Grave's disease is due to:
(1) hyperactivity of thyroid gland
(2) hypoactivity of adrenal cortex
(3) hyperactivity of adrenal medulla
(4) hypoactivity of Islet of Langerhans

41. A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin:
This is the result of:
(1) Over secretion of pars distalis
(2) Deficiency of iodine in diet
(3) Low secretion of growth hormone
(4) Cancer of the thyroid gland

42. What is the correct order of events occurring in blood clotting ?
I. Conversion of fibrinogen to fibrin.
II. Formation of clot
III. Thromboplastin formation
IV. Conversion of prothrombin to thrombin.
(1) III, II, I and IV
(2) III, IV, I and II
(3) III, IV, II and I
(4) IV, I, III and II

43. Which of the following sets of animals are uricotelic?
(1) Fish, snake, fowl and man.
(2) Fish, frog, lizard and fowl.
(3) Crow, snake, cockroach and lizard.
(4) Camel, dog, monkey and man.

44. The following diagram represents the Malpighian body. Identify the parts from A to D in the given structure.



(1) A–Efferent arteriole, B–Afferent arteriole, C–Bowman's capsule, D–DCT.
(2) A–Afferent arteriole, B–Efferent arteriole, C–Renal corpuscle, D–Proximal convoluted tubule.
(3) A–Efferent arteriole, B–Bowman's capsule; C–Afferent arteriole, D–PCT.
(4) A–Afferent arteriole, B–Efferent arteriole, C–Bowman's capsule, D–DCT.

45. Following are the points of mechanism of JGA, arrange them accordingly.
(A) Activation of JG cells.
(B) Activated JG cells release renin.
(C) Fall in GFR.
(D) Increase of glomerular blood flow.
(E) GFR back to normal.
(1) E, A, D, C, B (2) C, A, B, D, E
(3) A, B, C, D, E (4) C, A, D, B, E

46. How much per cent of the filtrate is nearly reabsorbed by the renal tubules?
(1) 70 – 80% (2) 85%
(3) 99% (4) 90%

47. When a person is suffering from poor renal reabsorption, which one of the following will not help in maintenance of blood volume?
(1) Increased ADH secretion.
(2) Decreased glomerular filtration.
(3) Increased arterial pressure in kidneys.
(4) Decreased arterial pressure in kidneys.

48. The following are steps of dialysis.
A. Blood is passed into vein.
B. Blood is mixed with heparin like substance.
C. Blood is mixed with anti-heparin like substance.
D. Blood is drained from convenient artery.
E. Blood is passed through a coiled and porous cellophane tube bathing in dialysis fluid.
F. Removal of nitrogenous wastes from blood.
The correct sequence of steps is
(1) A→B→C→D→E→F
(2) D→B→E→F→C→A
(3) F→C→E→B→A→D
(4) D→C→E→F→B→A

49. Which of the following is incorrect about counter-current mechanism?
(1) Flow of filtrate in two limbs of vasa recta is in opposite direction.
(2) Flow of blood in two limbs of vasa recta is also in opposite direction.
(3) NaCl is transported by ascending limb of HL which is exchanged with the descending limb of vasa recta.
(4) NaCl is returned to interstitium by the ascending portion of vasa recta.

50. Choose the right sequential phenomena during the passage of CO_2 from blood to tissues.
(P) Absorption of CO_2 by blood.
(Q) Reaction of CO_2 with water forming H_2CO_3 inside RBCs and then into HCO_3^- and H^+ ions.
(R) Reaction of CO_2 with water forming H_2CO_3 inside plasma followed by conversion into H^+ and HCO_3 ions.
(S) Combination of H^+ with haeme part of HbO_2 to release O_2.
(T) Combination of HCO_3^- with haeme part of HbO_2 to form reduced haemoglobin and release of O_2.
(1) P, R, S (2) P, Q, T
(3) P, Q, S (4) P, R, T