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PRABAL TEST PAPER

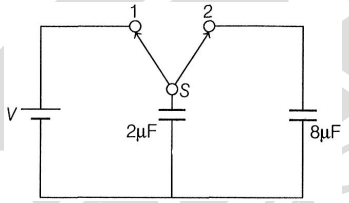
Time : 1 : 00 Hr. **Question : 50**

PHYSICS

01. An ideal gas expands according to law p^2V=cons.
(a) such expansion is possible by cooling
(b) such expansion is possible by heating
(c) T-V graph is straight line
(d) T-V graph is a parabola
(1) (b) and (c) (2) (b) and (d)
(3) (a) and (c) (4) (a) and (d)

02. A polyatomic gas has two vibrational modes. The ratio of its molar specific heats at constant pressure to that at constant volume is
(1) 6/5 (2) 5/4
(3) 9/7 (4) 11/9

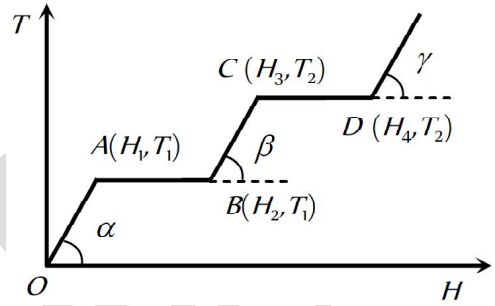
03. A capacitor of 2 μF is charged as shown in the diagram. When the switch S is turned to position 2, the percentage of its stored energy, which is dissipated, is



(1) 0% (2) 20% (3) 75% (4) 80%

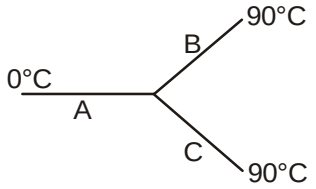
04. The coefficient of apparent expansion of mercury in a glass vessel is 153×10^{-6}/°C and in a steel vessel is 144×10^{-6}/°C. If α for steel is 12×10^{-6}/°C, then that of glass is
(1) 9×10^{-6}/°C
(2) 6×10^{-6}/°C
(3) 36×10^{-6}/°C
(4) 27×10^{-6}/°C

05. The graph shows the variation of temperature (T) of one kilogram of a material with the heat (H) supplied to it. At O, the substance is in the solid state. From the graph, we can conclude that



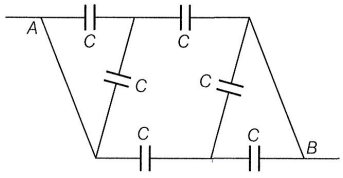
(1) T_2 is the melting point of the solid
(2) BC represents the change of state from solid to liquid
(3) $(H_2 - H_1)$ represents the latent heat of fusion of the substance
(4) $(H_3 - H_1)$ represents the latent heat of vaporization of the liquid

06. Three rods made of the same material and having the same cross section have been joined as shown in the figure. Each rod is of the same length. The left and right ends are kept at 0°C and 90°C respectively. The temperature of the junction of the three rods will be



(1) 45°C (2) 60°C (3) 30°C (4) 20°C

07. A network of six identical capacitors, each of value C, is made as shown in the figure. Equivalent capacitance between points A and B is



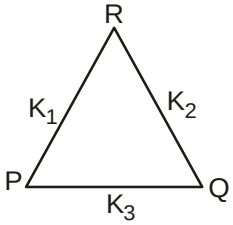
(1) C/4 (2) 3 C/4 (3) 4 C/3 (4) 3 C

08. A parallel plate capacitor have plate area A and plate separation d is charged by a battery of voltage V. The battery is then disconnected. The work needed to pull the plates to separation 2d is

(1) $\frac{AV^2\varepsilon_0}{d}$ (2) $\frac{2AV^2\varepsilon_0}{d}$

(3) $\frac{AV^2\varepsilon_0}{2d}$ (4) $\frac{3AV^2\varepsilon_0}{2d}$

09. Three rods of same dimensions are arranged as shown in figure they have thermal conductivities K_1, K_2 and K_3 The points P and Q are maintained at different temperatures for the heat to flow at the same rate along PRQ and PQ then which of the following option is correct



(1) $K_3 = \frac{1}{2}(K_1 + K_2)$ (2) $K_3 = K_1 + K_2$

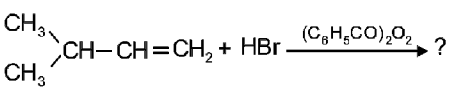
(3) $K_3 = \frac{K_1K_2}{K_1 + K_2}$ (4) $K_3 = 2(K_1 + K_2)$

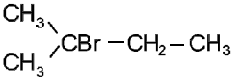
10. A bimetallic strip is formed out of two identical strips of length L, one of copper and other of brass. The coefficients of linear expansion of the two metals are α_C and α_B. On heating, the temperature of the strip goes up by ΔT and the strip bends to form an arc of radius of curvature R. Then R is not
(1) Proportional to ΔT
(2) Inversely proportional to ΔT
(3) Independent of L
(4) Inversely proportional to $|\alpha_B - \alpha_C|$

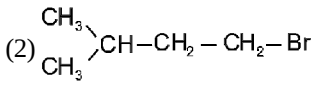
CHEMISTRY

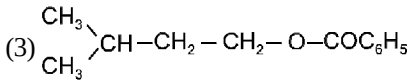
11. Which of the following alkane cannot be made in good yield by Wurtz reaction?
(1) n-Hexane
(2) 2,3-Dimethylbutane
(3) n-Heptane
(4) n-Butane

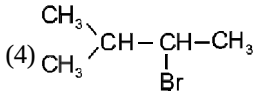
12. The major product of the following chemical reaction is:



(1) 

(2) 

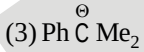
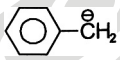
(3) 

(4) 

13. Ethane is formed during the formation of chloromethane by chlorination of methane because:
(1) higher members of the hydrocarbons are generally formed during reactions
(2) two methyl free radicals may combine during chlorination to give ethane
(3) two chloromethane molecules react to form ethane
(4) chlorine free radical reacts with methane to give ethane

14. Most stable carbanion is :

(1) $PhCH_2CH_2^-$ (2) 

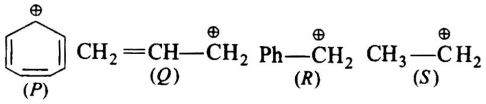
(3)  (4) 

15. Which one of the following gives more faster reaction

(1)  (2) 

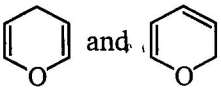
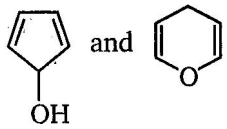
(3)  (4) 

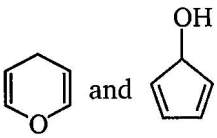
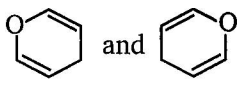
16. Arrange the following cations in decreasing order of stability:



(1) P > R > Q > S (2) R > P > S > Q
(3) Q > R > P > S (4) P > Q > S > R

17. Which of the following pairs of structures does not represent isomers?

(1)  (2) 

(3)  (4) 

18. **Assertion:** Toluene on Friedel-Crafts methylation gives o-and p- xylene.
Reason: CH_3 group bonded to benzene ring increases electron density at o-and p-position.

(1) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(3) Assertion is true but Reason is false.
(4) Assertion is false but Reason is true.

19. Classify the following as acid or base according to Bronsted-Lowry concept.
(i) CH_3COO^- (ii) H_3O^+
(iii) SO_4^{2-} (iv) HCl
(1) (i)–Bronsted base; (ii)–Bronsted base; (iii)–Bronsted base; (iv)–Bronsted acid
(2) (i)–Bronsted acid; (ii)–Bronsted acid; (iii)–Bronsted acid; (iv)–Bronsted base
(3) (i)–Bronsted base; (ii)–Bronsted acid; (iii)–Bronsted base; (iv)–Bronsted acid
(4) (i)–Bronsted acid; (ii)–Bronsted acid; (iii)–Bronsted base; (iv)–Bronsted base

20. Fill in the blanks in the given table with the appropriate choice.

Species	Conjugate acid	Conjugate base
HCO_3^-	p	CO_3^{2-}
HSO_4^-	H_2SO	q
NH_3	r	s
H_2O	t	OH^-

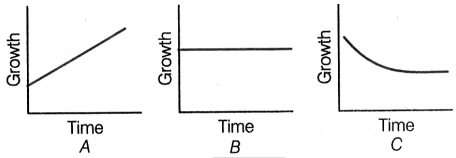
(1) p–H_2CO_3; q–SO_4^{2-}; r–NH_4^+; s–NH_2^-; t–H_3O^+
(2) p–HCO_3^-; q–H_2SO_3; r–NH_2^-; s–NH_4^+; t–H_3O^+
(3) p–H_2CO_3; q–HSO_4^-; r–NH_4^+; s–NH_2^-; t–H_2O
(4) p–HCO_3^-; q–H_2SO_4; r–NH_2^+; s–NH_2^-; t–OH^-

BOTANY

21. Which of the following statements are correct?
I. The plant grow and develop from the seedling to the reproductive stage.
II. The development of a mature plant from a zygote. follow a precise and highly ordered succession of events.
III. The seeds goes into a period of suspended growth in the presence of unfavourable conditions.
IV. During the process of development, a simple body organisation is formed that produces roots, leaves, branches, flowers, fruits, and seeds and eventually they die.
V. Only extrinsic (external) factor governs and controls the developmental processes in plants.
Choose the correct answer from the options given below.
(1) I, III and IV
(2) I, II and IV
(3) I, II and III
(4) I and III

22. Read the following statements about the phase of elongation.
I. It is characterised by increased vacuolation.
II. It shows cell enlargement.
III. In this phase, new cell wall is deposited.
IV. Growth is maximum in terms of wall thickening.
V. Growth is minimum.
Choose the option containing the correct statements.
(1) I, II and III (2) I, II and V
(3) II and IV (4) I, II, III and V

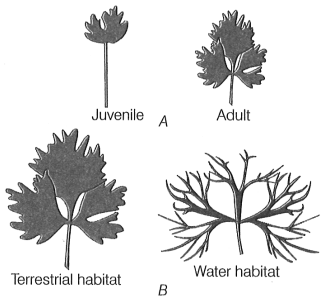
23. Among the following graphs, which shows the arithmetic growth curve?



(1) A and B (2) B and C
(3) A and C (4) Only A

24. In the expression, $W_1 = W_0e^{rt}$ (geometrical growth), W_0, W_1, r and t represents
(1) W_0–Initial size; W_1–Final size; r–Growth rate; t–Time of growth
(2) W_0–Final size; W_1–Initial size; r–Growth rate; t–Time of growth
(3) W_0–Final size; W_1–Initial size; r–Growth rate; t–Time of single cell division
(4) W_0–Initial size; W_1–Final size; r–Growth rate; t–Time of single cell division

25. Diagrams A and B indicate the shape of leaves in larkspur and buttercup, respectively. Choose the correct option.

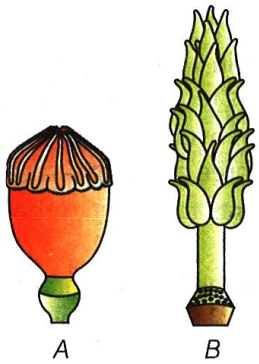


(1) The juvenile and adult leaves of larkspur differ in colour from those in mature plant
(2) Leaves of buttercup differ in shape due to its environment
(3) There is no variation in sizes of leaves of larkspur and buttercup
(4) None of the above

26. Flowers with single ovule in ovary, having inflorescence of many packed flowers and well exposed stamens, are most likely to be pollinated by
(1) Water (2) Fish
(3) Wind (4) Bats

27. More than one ovule in an ovary is found in
(1) watermelon, paddy, wheat
(2) maize, mango, wheat
(3) wheat, paddy, mango
(4) watermelon, papaya, orchids

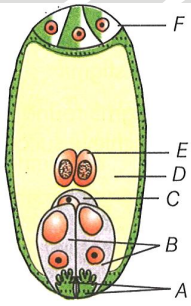
28. Consider the diagrams below and identify the correct option



(1) A is multicarpellary, syncarpous pistil of Michella (2) B represents multicarpellary, apocarpous gynoecium of Michelia
(3) A and B represent two types of gynoecium in Michelia
(4) A and B represent the initial and later stages of gynoecium in Papaver

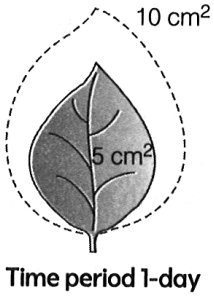
29. Ovules generally differentiate a single MMC in the ..... region of the nucellus and it is a large cell containing ..... cytoplasm and a prominent nucleus
(1) chalazal; dense
(2) micropylar; bisporic
(3) micropylar; dense
(4) chalazal; bisporic

30. Identify A to F in the diagram given below.



(1) A-Egg cell, B-Filiform apparatus, C-Synergid, D-Antipodals, E-Polar nuclei, F-Central cell
(2) A-Egg cell, B-Synergid, C-Filiform apparatus, D-Antipodals, E-Central cell, F-Polar nuclei
(3) A-Central cell, B-Egg cell, C-Synergid, D-Antipodals, E-Filiform apparatus, F-Polar nuclei
(4) A-Filiform apparatus, B-Synergid, C-Egg cell, D-Central cell, E-Polar nuclei, F-Antipodals

31. In the given figure, find out the absolute and relative growth rate and choose the correct option.



(1) Absolute Growth Rate (AGR)–1 cm^2; Relative Growth Rate (rGR)–1%
(2) Absolute Growth Rate (AGR)–100 cm^2; Relative Growth Rate (rGR)–5%
(3) Absolute Growth Rate (AGR)–5 cm^2; Relative Growth Rate (rGR)–100%
(4) Absolute Growth Rate (AGR)–0.5 cm^2; Relative Growth Rate (rGR)–100%

32. I. Cell division
II. Cell enlargement
III. Pattern formation
IV. Tropic growth and seed formation
V. Flowering and fruiting
VI Response to wound
VII. Response to stresses of biotic and abiotic origin
Which one is correct?
(1) Functions of growth promoters–I, II, VII; Functions of growth inhibitor–III, IV, V, VI
(2) Functions of growth promoters–VI, II; Functions of growth inhibitor–I, III, IV, V
(3) Functions of growth promoters–I, II, III, IV, V; Functions of growth inhibitor–VI, VII
(4) Functions of growth promoters–VI, VII; Functions of growth inhibitor–I, II, III, IV, V

33. Some statements about plant growth regulators A, B and C are given below.
Read the statements and identify the PGRs.
(i) 'A' promotes rapid internode elongation in deep water plants and helps upper parts of the shoot to remains above the water.
(ii) 'B' helps in delaying senescence of leaves and other organs by controlling synthesis of protein and mobilisation of nutrients.
(iii) 'C' controls xylem differentiation and helps in cell division.
(1) 'A'–Auxin, 'B'–Ethylene, 'C'–Cytokinin
(2) 'A'–Ethylene, 'B'–Cytokinin, 'C'–Auxin
(3) 'A'–Cytokinin, 'B'–Auxin, 'C'–Ethylene
(4) 'A'–Abscisic acid, 'B'–Ethylene, 'C'–Cytokinin

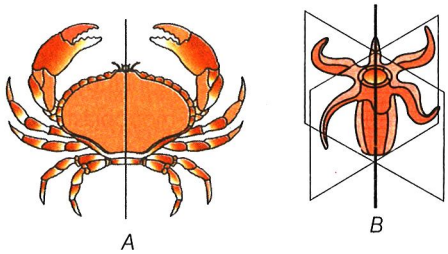
34. The process of formation of microspores from pollen mother cell through ... A... is called... B.... Microspores are arranged as ... C.... As the anthers matures and dehydrate, microspores develop into the ...D.
Fill in the blanks A to D.
(1) A-pollen grains, B-microspore tetrad, C-microsporogenesis, D-meiosis
(2) A-microspore tetrad, B-microsporogenesis, C-meiosis, D-pollen grains
(3) A-microsporogenesis, B-microspore tetrad, C-pollen grain, D-meiosis
(4) A-meiosis, B-microsporogenesis, C-microspore tetrad, D-pollen grains

35. Identify the correct ploidy level of different structures of angiospermous ovule.

	Nucellus	MMC	Functional Megaspore
(1)	n	2n	2n
(2)	2n	2n	n
(3)	2n	n	n
(4)	n	n	2n

ZOOLOGY

36. Choose the correct type of symmetry for the animals, A and B.



(1) Bilateral, Asymmetrical, respectively
(2) Bilateral, Radial, respectively
(3) Radial, Bilateral, respectively
(4) Radial, Radial, respectively

37. Which of the following is incorrect?
(1) Animals belongs to phylum-Aschelminthes, have scattered mesodermal pouches in between the body wall and alementary canal
(2) Mesoglea is an undifferentiated layer between ectoderm and endoderm
(3) The body cavity is lined by mesoderm in hemichordates
(4) Arthropods possess the same body cavity as observe in platyhelminths

38. Which of the following option contain the members of the phylum-Annelida only?
(1) Hirudinaria, Nereis and Wuchereria
(2) Earthworms, chaetopleura and Pila
(3) Pheretima, Hirudinaria and Nereis
(4) Aplysia, Nereis and Dentalium

39. Which one is not cartilaginous fish?
(1) Carcharodon (great white shark), Trygon (sting ray)
(2) Exocoetus (flying fish), Catla (katla), Clarias (magur)
(3) Scoliodon (dog fish)
(4) Pristis (saw fish)

40. Fully ossified endoskeleton with long pneumatic bones are expected to be found in
(1) house lizard (2) flying fish
(3) pigeon (4) tadpole of frog

41. Find the odd one.
(1) Sea lily (2) Sea fan
(3) Sea cucumber (4) Sea urchin

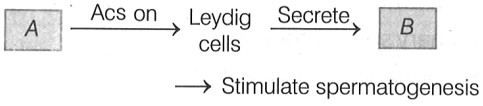
42. The structure which is present in sperm and which stimulate division in zygote is :-
(1) Acrosome
(2) Tail
(3) Proximal centriole
(4) Mitochondria

43. After spermiogenesis sperm's head become embedded in :-
(1) Germinal epithelium
(2) PGCs
(3) Sertoli cells
(4) Leydig cells

44. Choose the correct statement.
(1) Size of testis is 4-5 cm in length and 1 cm in width.
(2) The scrotum is maintained at body temperature.
(3) The testes are situated outside the abdominal cavity in humans.
(4) The earliest stages of spermatogenesis occur outside the testis.

45. Which of the following cells have haploid number of chromosomes?
I. Primary spermatocytes
II. Secondary spermatocytes
III. Spermatid IV. Spermatogonia
V. Primary oocyte VI. Second polar body
(1) I, II, III and IV (2) II, IV, V and VI
(3) II, III and VI (4) IV, V and VI

46. Give the name of two hormones A and B in the figure given below



(1) FSH and GH (2) LH and androgens
(3) GH and LH (4) GH and lactin

47. What happens during the follicular phase of menstrual cycle?
(1) Proliferation of endometrium
(2) Reduction of blood supply to endometrium
(3) Regression of endometrium
(4) No effect on endometrium

48. Which of the following accurately describes the role of LH and FSH during the menstrual cycle?
(1) LH stimulates follicular development, while FSH triggers ovulation
(2) FSH stimulates follicular development, while LH triggers ovulation
(3) Both LH and FSH stimulate the release of ova during menstruation
(4) LH and FSH have no direct impact on the menstrual cycle

49. Choose the correct statements for starfish.
I. Sexes are separate and reproduction is sexual.
II. Development is indirect with free-swimming larva.
III. Mouth is present on the upper (dorsal) side and anus on the lower (ventral) side.
IV. Endoskeleton is made up of calcareous ossicles.
(1) I and III (2) I, II and IV
(3) I, II and III (4) III and IV

50. Read the following four statements (A-D):
(A)Process of formation of mature female gamete is called oogenesiss
(B) At puberty 60,000 to 80,000 total primary follicles are left in each ovary
(C) No oogonia cells are formed or added after birth in female
(D)Process of gametogenesis begins in female at puberty.
How many of the above statements are right?
(1) One (2) Four
(3) Two (4) Three