



RGP – RANKERS GENIUS PROGRAM

(Physics, Chemistry and Biology)

Set

A

Time: 1 Hour

Moving to 12th (NEET)

Marks: 120

1. General Instructions:

- * This test paper consists of 60 question in 3 section (A, B, C)

Marking Scheme:

- Full marks: + 2 if answered correctly.
- Zero marks: 0 if not attempted or incorrect.

2. RGP College Grant Criteria:

- ✓ Students must score a minimum of 70% positive marks in RGP.
- ✓ Student must get under AIR 5,000 in JEE/NEET Examination.

3. Cash Reward Criteria:

- ✓ Exciting Cash Rewards for RGP Toppers

SENIOR WING (Student's Moving to Class XI th , XII th , Dropper JEE /NEET)		JUNIOR WING (Student's Moving to Class IX th & X th)	
Overall 1 st Topper	₹ 21,000/-	Overall 1 st Topper	₹ 5,100/-
Overall 2 nd Topper	₹ 11,000/-	Overall 2 nd Topper	₹ 3,100/-
Overall 3 rd Topper	₹ 5,100/-	Overall 3 rd Topper	₹ 2,100/-
Overall 4 th – 8 th Topper	₹ 2,100/-	Overall 4 th – 8 th Topper	₹ 1,100/-
Overall 9 th – 15 th Topper	₹ 1,100/-	Overall 9 th – 15 th Topper	₹ 500/-

** Rankings from 1 to 20 are determined based on the specific criteria outlined in the FAQ section of our website, www.myrankers.com.

4. Scholarship Criteria in Rankers Offline Classroom Program:

- ✓ 100% Fee Waiver – Student Scoring 90% and Above
- ✓ 80% Fee Waiver – Student Scoring 85% to 89.999%
- ✓ 60% Fee Waiver – Student Scoring 75% to 84.999%
- ✓ 50% Fee Waiver – Student Scoring 70% to 74.999%
- ✓ 40% Fee Waiver – Student Scoring 60% to 69.999%
- ✓ 20% Fee Waiver – Student Scoring 40 % to 59.999%
- ✓ 10% Fee Waiver – Student Scoring 30% to 39.999%
- ✓ 5% Fee Waiver – All the Aspirants Appearing in RGP

RGP RESULT & REWARD CEREMONY

Result Date: 12th Feb 2025

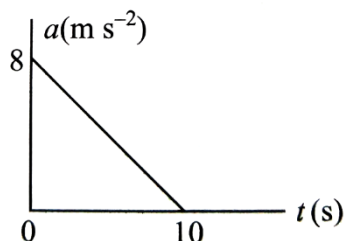
Check Your Result at: www.myrankers.com

Reward Ceremony Date: 16th Feb 2025

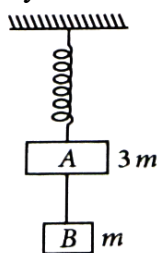
Student's Name: -

Physics (Section – A)

- The dimension of the universal constant of gravitation, G , is
 (A) $[ML^2T^{-1}]$ (B) $[M^{-1}L^3T^{-2}]$
 (C) $[M^{-1}L^2T^{-2}]$ (D) $[ML^3T^{-2}]$
- The error in the measurement of the radius of a sphere is 2%. What will be that percentage error in the estimation of the volume of the sphere?
 (A) 2% (B) 4% (C) 6% (D) 8%
- A particle starts from rest. Its acceleration a versus time t is shown in the figure. The maximum speed of the particle will be



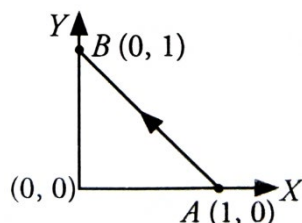
- (A) 80 ms^{-1} (B) 40 ms^{-1} (C) 18 ms^{-1} (D) 2 ms^{-1}
- Maximum range for a projectile motion is given as R . The maximum height will be
 (A) R (B) $2R$ (C) $R/4$ (D) $R/2$
 - Find the component of vector $\vec{A} = 2\hat{i} + 3\hat{j}$ along the direction $(\hat{i} - \hat{j})$.
 (A) $-\frac{1}{2}(\hat{i} - \hat{j})$ (B) $-\frac{1}{2}(\hat{i} + \hat{j})$ (C) $\frac{1}{2}(\hat{i} - \hat{j})$ (D) $\frac{1}{2}(\hat{i} + \hat{j})$
 - Two blocks A and B of masses $3m$ and m respectively are connected by a massless and inextensible string. The whole system is suspended by a massless spring as shown in figure. The magnitudes of acceleration of A and B immediately after the string is cut, are respectively



- (A) $\frac{g}{3}$ (up), g (down) (B) $\frac{g}{3}$ (down), g (up)
 (C) g (up), $\frac{g}{3}$ (down) (D) g (down), $\frac{g}{3}$ (up)

----- Rough Work -----

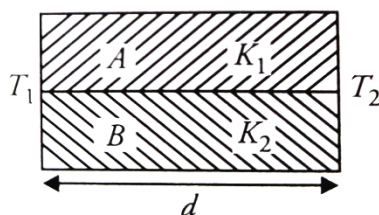
7. A neutron moving with a speed ' v ' makes a head on collision with a stationary hydrogen atom in ground state. The minimum kinetic energy of the neutron for which inelastic collision will take place is
 (A) 20.4 eV (B) 10.2 eV (C) 12.1 eV (D) 16.8 eV
8. Consider a force $\vec{F} = -x\hat{i} + y\hat{j}$. The work done by this force in moving a particle from point $A(1, 0)$ to $B(0, 1)$ along the line segment is (all quantities are in SI units)



- (A) $\frac{3}{2}$ (B) 2 (C) 1 (D) $\frac{1}{2}$
9. A mouse of mass m jumps on the outside edge of a rotating ceiling fan of moment of inertia I and radius R . The fractional loss of angular velocity of the fan as a result is
 (A) $\frac{mR^2}{I + mR^2}$ (B) $\frac{I}{I + mR^2}$ (C) $\frac{I - mR^2}{I}$ (D) $\frac{I - mR^2}{I + mR^2}$
10. The mass of the moon is $\frac{1}{144}$ times the mass of a planet and its diameter is $\frac{1}{16}$ times the diameter of a planet. If the escape velocity on the planet is v , the escape velocity on the moon will be
 (A) $\frac{v}{4}$ (B) $\frac{v}{12}$ (C) $\frac{v}{3}$ (D) $\frac{v}{6}$

----- Rough Work -----

11. Two rods A and B of different materials are welded together as shown in figure. Their thermal conductivities are K_1 and K_2 . The thermal conductivity of the composite rod will be

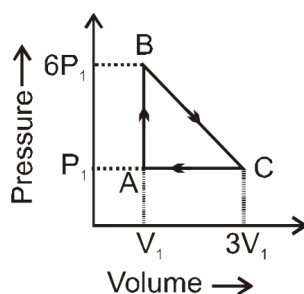


- (A) $\frac{3(K_1+K_2)}{2}$ (B) $K_1 + K_2$ (C) $2(K_1 + K_2)$ (D) $\frac{K_1+K_2}{2}$
12. 0.5 mole of N_2 at 27°C is mixed with 0.5 mole of O_2 at 42°C . The temperature of the mixture is
 (A) 42°C (B) 34.5°C (C) 32.5°C (D) 37.5°C
13. If c_p and c_v denote the specific heats of nitrogen per unit mass at constant pressure and constant volume respectively, then
 (A) $c_p - c_v = 28/R$ (B) $c_p - c_v = R/28$
 (C) $c_p - c_v = R/14$ (D) $c_p - c_v = R$
14. A tuning fork vibrates with frequency 256 Hz and gives one beat per second with the third normal mode of vibration of an open pipe. What is the length of the pipe?
 (Speed of sound in air is 340 ms^{-1})
 (A) 190 cm (B) 180 cm (C) 200 cm (D) 220 cm
15. The force required to separate two glass plates of area 10^{-2} m^2 with a film of water 0.05 mm thick between them, is (Surface tension of water is $70 \times 10^{-3} \text{ N/m}$)
 (A) 28 N (B) 14 N (C) 50 N (D) 38 N

----- Rough Work -----

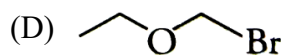
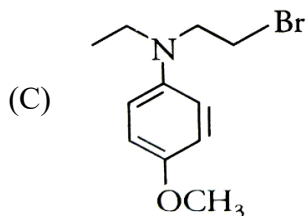
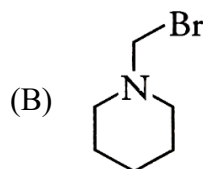
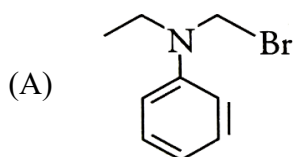
Chemistry (Section – B)

16. How does the equilibrium vapour pressure of water change with temperature?
 (A) It decreases with temperature.
 (B) It remains constant.
 (C) It increases with temperature.
 (D) It fluctuates.
17. Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenyl amine as indicator. The number of moles of Mohr's salt required per mole of dichromate is
 (A) 3 (B) 4 (C) 5 (D) 6
18. What is the mole fraction of NaOH in a solution where 4 g of NaOH dissolves in 36 g of H₂O, and what is the molarity of the solution? (Assuming specific gravity of the solution is 1 g mL⁻¹).
 (A) Mole fraction of NaOH = 0.01, Molarity = 2.5 M
 (B) Mole fraction of NaOH = 0.02, Molarity = 5.0 M
 (C) Mole fraction of NaOH = 0.03, Molarity = 2.5 M
 (D) Mole fraction of NaOH = 0.04, Molarity = 2.5 M
19. The elements in which electrons are progressively filled in 4f-orbital are called:
 (A) actinoids (B) transition elements
 (C) lanthanoids (D) halogens
20. Write an expression for K_c for the reaction $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$.
 (A) $K_c = \frac{[\text{PCl}_3] \cdot [\text{Cl}_2]}{[\text{PCl}_5]}$ (B) $K_c = \frac{[\text{PCl}_5] \cdot [\text{Cl}_2]}{[\text{PCl}_3]}$
 (C) $K_c = \frac{[\text{PCl}_3]}{[\text{PCl}_5] \cdot [\text{Cl}_2]}$ (D) $K_c = \frac{[\text{PCl}_5] \cdot [\text{PCl}_3]}{[\text{Cl}_2]}$
21. An ideal gas is taken around the cycle ABCA as shown in P-V diagram. The net work done by the gas during the cycle is equal to:
 (A) $12P_1V_1$
 (B) $6P_1V_1$
 (C) $5P_1V_1$
 (D) P_1V_1



----- Rough Work -----

22. Which of the following sets of quantum numbers could represent the last electron added to complete the electron configuration for a ground state atom of Br ($Z = 35$) according to the Aufbau principle, $n; l; m_l; m_s$
- (A) $4; 0; 0; -\frac{1}{2}$ (B) $4; 1; 1; -\frac{1}{2}$
 (C) $3; 1; 1; -\frac{1}{2}$ (D) $4; 1; 2; +\frac{1}{2}$
23. Which of the following is NOT a product of the reaction between methane and steam in the presence of a nickel catalyst?
- (A) Carbon monoxide (B) Dihydrogen (C) Methane (D) Carbon dioxide
24. Which halide of magnesium has the highest ionic character?
- (A) Chloride (B) Bromide (C) Iodide (D) Fluoride
25. What is the type of hybridisation of each carbon in $(\text{CH}_3)_2\text{CO}$?
- (A) 3 sp^3 hybridised carbon atoms
 (B) 1 sp^3 and 1 sp^2 hybridised carbon atoms
 (C) 1 sp^3 and 2 sp^2 hybridised carbon atoms
 (D) 2 sp^3 and 1 sp^2 hybridised carbon atoms
26. Which of the following compounds will form the precipitate with aq. AgNO_3 solution most readily?



----- Rough Work -----

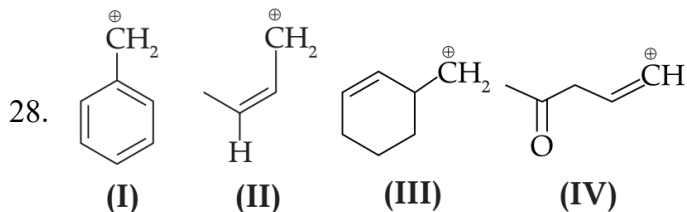
27. Given below are two statements:

Statement I: In an organic compound, when inductive and electromeric effects operate in opposite directions, the inductive effect predominates.

Statement II: Hyperconjugation is observed in *o*-xylene.

In the light of the above statements, choose the correct answer from the options given below:

- (A) Statement I is true but Statement II is false.
 (B) Statement I is false but Statement II is true.
 (C) Both Statement I and Statement II are true.
 (D) Both Statement I and Statement II are false.



Among the given species the resonance stabilised carbocation's are:

- (A) (III) and (IV) only (B) (I), (II) and (III) only
 (C) (I), (II) and (IV) only (D) (I) and (II) only
29. Write the IUPAC name of the compound $\text{CH}_3\text{CH}_2-\text{C}(\text{CH}_2\text{CH}_3)=\text{C}-\text{CH}_3$
- (A) 3-ethyl-2-methyl butadiene-1,3 (B) 2-ethyl-3-methyl butadiene-1,3
 (C) 2-ethyl-4-methyl butadiene-1,2 (D) 2-ethyl-4-methyl butadiene-2,3
30. The solubility product for a salt of the type AB is 4×10^{-8} . What is the molarity of its saturated solution?
 (A) 2×10^{-4} mol/L (B) 16×10^{-16} mol/L
 (C) 2×10^{-4} mol/L (D) 4×10^{-4} mol/L

----- Rough Work -----

Biology (Section – C)

31. Synthesis of ATP from ADP and inorganic phosphate in the presence of light is known as-
 (A) Phosphorylation (B) Photo-phosphorylation
 (C) Photorespiration (D) Photooxidation
32. Select the correct sequence of events occurring during Prophase-I of Meiosis-I:
 A. Nuclear envelope breakdown
 B. Synaptonemal complex formation
 C. Compaction of chromosomes
 D. Terminalisation of chiasmata
 E. Crossing over
 Choose the most appropriate answer form the options given below:
 (A) C → B → E → D → A (B) C → A → B → D → E
 (C) B → C → A → D → E (D) C → A → B → E → D
33. Meandrina, Scypha, Salpha, Echinus Chaetopleura, Petromyzon, Amphioxus, Carcharodon, Ancylostoma, Sea hare, corvus, calotes, pteropus, king crab, doliolum. Calculate the number of vertebrates
 (A) 4 (B) 5 (C) 6 (D) 7
34. **Assertion (A):** Echinoderms are spiny-bodied animals.
Reason (R): Their exoskeleton is made up of calcareous ossicles.
 (A) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (B) Both (A) and (R) are true and (R) is not the correct explanation of (A)
 (C) (A) is true but (R) is false
 (D) (A) is false but (R) is true
35. Read the following statements.
 A. Metagenesis is observed in all coelenterates.
 B. Echinoderms are exclusively marine, triploblastic, and monoecious animals.
 C. Roundworms are coelomates with complete digestive tract.
 D. Comb plates present in ctenophores help in locomotion.
 E. Water canal system is a characteristic of sponges.
 Choose the correct answer from the options given below:
 (A) A, B, C are correct (B) B, C, D are correct
 (C) C, D, E are correct (D) D and E are correct

----- Rough Work -----

36. In alcohol fermentation
 (A) Triose phosphate is the electron donor while acetaldehyde is the electron acceptor
 (B) Triose phosphate is the electron donor while pyruvic acid is the electron acceptor
 (C) There is no electron donor
 (D) Oxygen is the electron acceptor
37. In Krebs cycle, the FAD precipitates as electron acceptor during the conversion of
 (A) Fumaric acid to malic acid (B) Succinic acid to fumaric acid
 (C) Succinyl CoA to succinic acid (D) α – ketoglutarate to succinyl CoA
38. The ability of a plant to follow different pathways and produce different structures in response to environment is known as
 (A) Heterophylly (B) Plasticity
 (C) Efficiency index (D) Vernalisation
39. Which one of the following statement is totally wrong about the occurrence of notochord while the other three are correct?
 (A) It is present through life in Amphioxus
 (B) It is present only in larval tail in Ascidians
 (C) It is replaced by a vertebral column in adult frog
 (D) It is absent throughout life in humans from the very beginning
40. Coenocytic mycelium is present in
 (A) Deutermycetes (B) Ascomycetes
 (C) Basidimycetes (D) Phycomycetes
41. The gametophyte is not an independent, free-living generation in:
 (A) Polytrichum (B) Adiantum
 (C) Marchantia (D) Pinus
42. A poikilotherm having four-chambered heart is
 (A) *Columba* (B) *Chameleon*
 (C) *Crocodilus* (D) *Canis*
43. Mannitol is a sugar alcohol. It is as stored food in:
 (A) Fucus (B) Gracillaria
 (C) Chara (D) Porphyra

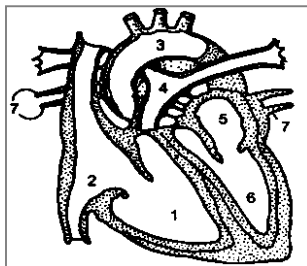
----- Rough Work -----

44. Which of the following genera is associated with coralloid roots?
(A) Cycas (B) Taxus
(C) Pinus (D) Sequoia
45. Placentation in Argemone is
(A) Basal (B) Parietal
(C) Marginal (D) Axile
46. Companion cells are part of
(A) Xylem (B) Phloem
(C) Pollen (D) Stomata
47. Nucleolus helps in the synthesis of
(A) r RNA (B) m RNA
(C) t RNA (D) DNA
48. Value of vital capacity is
(A) 4800 ml (B) 3200 ml
(C) 6000 ml (D) 2300 ml
49. Which is uricotelic
(A) Rattus (B) Rana
(C) Bony fishes (D) Aedes
50. A specialized nodal tissue embedded in the lower corner of the right atrium, close to Atrio-ventricular septum, delays the spreading of impulses to heart apex for about 0.1 sec. The delay allows.
(A) Blood to enter aorta (B) The ventricles to empty completely
(C) Blood to enter pulmonary arteries (D) The atria to empty completely.

----- Rough Work -----

51. The correct sequence of blood flow beginning at the pulmonary arteries and passing through the lungs and the systemic circulation is

- (A) 2 – 1 – 4 – systemic – 3 – 6 – 5 -7 lungs
 (B) 3 – 6 – 5 – 7 – systemic – 4 – 1 – 2 – lungs
 (C) 4 – lungs – 7 – 5 – 6 – 3 – systemic – 2 – 1
 (D) 6 – 4 – lungs – 3 – systemic – 2 – 1 – 5 – 7



52. The outline of principle event of urination is given below in unordered manner

- A. Stretch receptors on the wall of urinary bladder send signal to the central nervous system (CNS)
 B. The bladder fills with urine and becomes distended
 C. Micturition
 D. CNS passes on motor message to initiate the contraction of smooth muscles of bladder and simultaneous relaxation of urethral sphincter

The correct order of steps for urination is

- (A) A → B → C → D
 (B) D → C → B → A
 (C) B → A → D → C
 (D) C → B → A → D

53. If a molecule of carbon dioxide released into the blood in the food of a human foetus is exhaled through the mouth of the mother, it will not travel through the

- (A) Right atrium of the foetus
 (B) Right atrium of the mother
 (C) Left ventricle of the foetus
 (D) Left ventricle of the mother

54. Which one of the following is not a part of a renal pyramid?

- (A) Convolved tubules
 (B) Collecting ducts
 (C) Loops Henle
 (D) Peritubular capillaries

55. During the concentration of urine by the human kidneys, NaCl is returned to the medullary interstitium by the

- (A) Descending limb of the loop of Henle
 (B) Ascending limb of the loop of Henle
 (C) Descending limb of the vasa recta
 (D) Ascending limb of the vasa recta

----- Rough Work -----

56. F. Skoog observed that callus proliferated from the intermodal segments of tobacco stem when auxin was supplied with one of the following, except:
 (A) Extract of vascular tissues (B) Coconut milk
 (C) Absciscic acid (D) Yeast extract
57. Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin
 (A) promotes abscission of mature leaves only
 (B) does not affect mature monocotyledonous plants
 (C) can help in cell division in grasses, to produce growth
 (D) promotes apical dominance

58. Match the following:

	List I		List II
A.	Rose	I.	Twisted aestivation
B.	Pea	II.	Perigynous flower
C.	Cotton	III.	Drupe
D.	Mango	IV.	Marginal placentation

Choose the correct answer from the options given below:

- (A) A-I, B-II, C-III, D-IV
 (B) A-IV, B-III, C-II, D-I
 (C) A-II, B-III, C-IV, D-I
 (D) A-II, B-IV, C-I, D-III
59. Identify the type of flowers based on the position of calyx, corolla and androecium with respect to the ovary from the given figures (a) and (b):
 (A) (a) Hypogynous; (b) Epigynous
 (B) (a) Perigynous; (b) Epigynous
 (C) (a) Perigynous; (b) Perigynous
 (D) (a) Epigynous; (b) Hypogynous



60. Bulliform cells are responsible for
 (A) Protecting the plant from salt stress.
 (B) Increased photosynthesis in monocots.
 (C) Providing large spaces for storage of sugars.
 (D) Inward curling of leaves in monocots.

----- Rough Work -----