RANKERS
JEE | NEET | FOUNDATION

RGP – RANKERS GUARANTEED PROGRAM

Set
1

(Physics, Chemistry and Biology)

Time: 1 Hour   Studying in class 11ᵗʰ (NEET) & Moving to 12ᵗʰ (NEET)   Marks: 120

1. General Instructions: **(Paper Code: 1202)**

∗ *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:
  ✓ **Students must score a minimum of 70% positive marks in their respective papers.**
  ✓ **Exciting Cash Rewards for RGP Toppers**
    • **1ˢᵗ Topper – ₹ 21,000/-**
    • **2ⁿᵈ Topper – ₹ 11,000/-**
    • **3ʳᵈ – 5ᵗʰ Topper – ₹ 5,100/-**
    • **6ᵗʰ – 10ᵗʰ Topper – ₹ 2,100/-**
      Students Scoring Rank from 11ᵗʰ – 20ᵗʰ will get Exciting Rewards.

4. Scholarship Criteria in Rankers Offline Classroom Program:

  (100% FEE WAIVER – 1ˢᵀ TOPPER) **and must getting above 70% marks.**

  ✓ **80% Fee Waiver – Student Scoring 80% and above.**
  ✓ **60% Fee Waiver – Student Scoring 70% to 79.999%.**
  ✓ **50% Fee Waiver – Student Scoring 60% to 69.999%.**
  ✓ **40% Fee Waiver – Student Scoring 50% to 59.999%.**
  ✓ **20% Fee Waiver – Student Scoring 30 % to 49.999%**
 ✓ **10% Fee Waiver – All the Aspirants Appearing in RGP.**

Student's Name: - ....

School Name: - ....

Class: - .... **Mob. No.** ....

Student's Signature: - ……………………………. **Invigilator's Signature: -** …………………………………

## Physics (Section – A)

1. A stone is dropped from the top of the tower and travels 25 m in the last second of its journey. The height of the tower is: $(g = 10 \text{ m/s}^2)$
   (A) 45 m   (B) 50 m   (C) 80 m   (D) 75 m

2. An ideal gas is taken through series of changes ABCA. The amount of work involved in the cycle is:
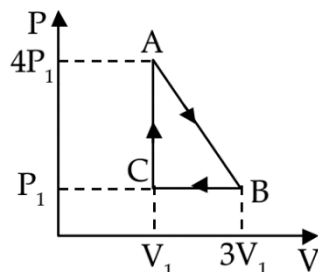
   (A) $12P_1V_1$ (B) $6P_1V_1$ (C) $3P_1V_1$ (D) P_1V_1

3. In a hydraulic press there is a larger piston of area 100 cm^2 at a height of 1.5 m relative to the smaller piston of area 125 cm^2. A 20 kg mass is loaded on the smaller piston. Density of oil in the press is 750 kg/m^3. The thrust on the load by the larger piston is:
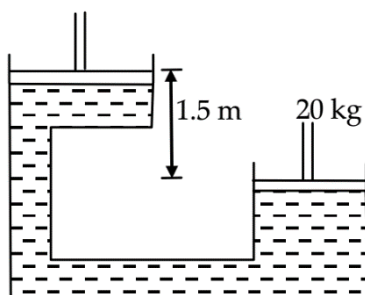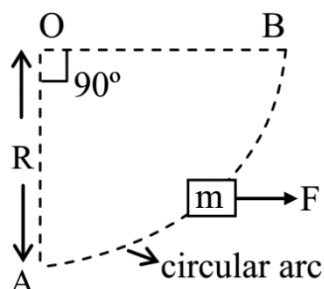

   (A) 375 N   (B) 475 N   (C) 325 N   (D) 425 N

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4. At an instant t, the coordinates of a particle are $x = at^2, y = bt^2$ and $z = 0$, then its speed at the instant t will be:

(A) $t\sqrt{a^2 + b^2}$ 　　　(B) $2t\sqrt{a^2 + b^2}$ 　　　(C) $\sqrt{a^2 + b^2}$ 　　　(D) $2t^2\sqrt{a^2 + b^2}$

5. A block of mass m is taken from A to B slowly under the action of a constant force F. Work done by this force is:
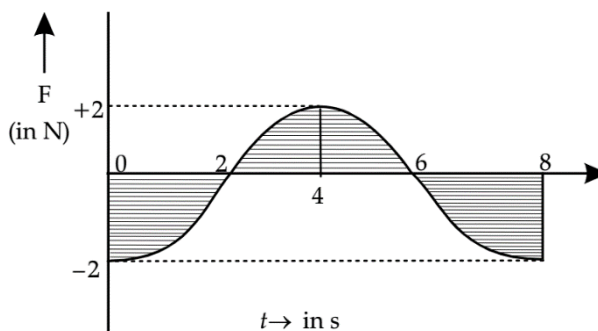

(A) FR 　　　(B) $\frac{\pi}{2}$ FR 　　　(B) $\frac{FR}{\sqrt{2}}$ 　　　(D) $\frac{FR}{4}$

6. A particle is oscillating according to the equation X = 7 cos 0.5 πt, where 't' is in second. The particle moves from the position of equilibrium to maximum displacement in time:

(A) 4.0 second 　　　(B) 2.0 second 　　　(C) 1.0 second 　　　(D) 0.5 second

7. A force – time graph for the motion of a body is shown in figure. Change in linear momentum between 0 s and 8 s is:


(A) zero 　　　(B) 4 N-s 　　　(C) 8 N-s 　　　(D) None

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8. If the length of a cylinder on heating increases by 2%, the area of its base will increase by:
   (A) 0.5% (B) 2% (C) 1% (D) 4%

9. Work done in converting one gram of ice at $-10°C$ into steam at $100°C$ is:
   (A) 5023 J (B) 6056 J (C) 3045 J (D) 725 J

10. A particle is given an initial speed u inside a smooth spherical shell of radius R = 1 m and it is just able to complete the circle. Acceleration of the particle when its velocity is vertical is:
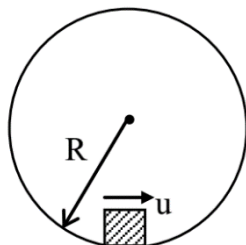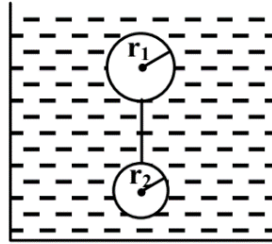

   (A) $g\sqrt{10}$ (B) g (C) $g\sqrt{2}$ (D) 3g

11. A uniform disc of mass M and radius 'R' is supported vertically by a pivot at its periphery as shown. A particle of mass M is fixed to the rim and raised to highest point above the centre. The system is released from rest and it can rotate about pivot freely. The angular speed of system when it attached object is directly beneath the pivot is: (rotation is in the plane of paper)
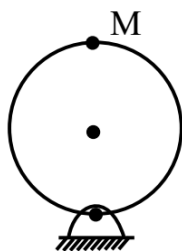
   (A) $\sqrt{\dfrac{42g}{11R}}$ (B) $\sqrt{\dfrac{8}{11}\dfrac{g}{R}}$ (C) $\sqrt{\dfrac{8}{3}\dfrac{g}{R}}$ (D) $\sqrt{\dfrac{3}{8}\dfrac{g}{R}}$

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12. A particle of mass 'm' is executing oscillations about the origin on the x-axis. Its potential energy is $U(x) = K|x|^3$ where K is a positive constant. If the amplitude of oscillation is 'a' then its time period T is:

(A) Proportional to $\frac{1}{\sqrt{a}}$

(B) Independent of a

(C) Proportional to $\sqrt{a}$

(D) Proportional to $a^{3/2}$

13. A wire is 4 m long and has a mass 0.2 kg. The wire is kept horizontally. A transverse pulse is generated by plucking one end of the taut (tight) wire. The pulse makes four trips back and forth along the cord in 0.8 sec. The tension is the cord will be: (Assume uniform tension throughout the wire)

(A) 80 N   (B) 160 N   (C) 240 N   (D) 320 N

14. Two solid spherical balls of radius r_1 and r_2 ($r_2 < r_1$), of density σ are connected with a light road and released in a viscous liquid column of lesser density ρ and coefficient of viscosity η, as shown in fig. The terminal velocity of spheres is:

(A) $\frac{2}{9}\frac{r_2^2 g}{\eta}(\sigma - \rho)$

(B) $\frac{2}{9}\frac{r_1^2 g}{\eta}(\sigma - \rho)$

(C) $\frac{2}{9}\frac{(r_1^3 + r_2^3)}{r_1 + r_2}\frac{(\sigma - \rho)g}{\eta}$

(D) $\frac{2}{9}\frac{(r_1^3 - r_2^3)}{r_1 - r_2}\frac{(\sigma - \rho)g}{\eta}$

15. The velocities of a particle in SHM at positions x_1 and x_2 are v_1 and v_2, respectively, its time period will be

(A) $2\pi\sqrt{\frac{(v_1^2 - v_2^2)}{(x_2^2 - x_1^2)}}$

(B) $2\pi\sqrt{\frac{(x_1^2 + x_2^2)}{(v_2^2 - v_1^2)}}$

(C) $2\pi\sqrt{\frac{(x_1^2 - x_2^2)}{(v_2^2 - v_1^2)}}$

(D) $2\pi\sqrt{\frac{(x_1^2 + x_2^2)}{(v_2^2 + v_1^2)}}$

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Chemistry (Section – B)

16. Match the items under list (1) with items under list (2) select the correct answers from the sets (A), (B), (C) and (D):

    List (1) Molecule
    (a) PCl_5 (b) F_2O (c) BCl_3 (d) NH_3

    List (2) Shape
    (i) V-shaped (ii) Triangular planar (iii) Trigonal bipyramidal
    (iv) Trigonal pyramidal (v) Tetrahedral

    (A) a - i, b - v, c - iv, d - iii
    (B) a - ii, b - iii, c - i, d - ii
    (C) a - iv, b - iii, c - ii, d - v
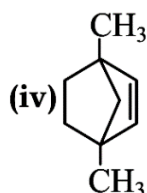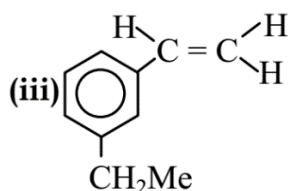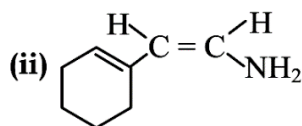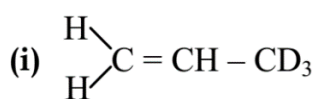   (D) a - iii, b - i, c - ii, d - v

17. Calculate the work done when 2 moles of hydrogen expand isothermally and reversibly at 27°C from 15 to 50 litres.
    (A) 14.45 k cal (B) 1445 J (C) – 1445 cal (D) 14.45 kJ

18. The equilibrium constant expression for the equilibrium $2NH_3(g) + 2O_2(g) \rightleftharpoons N_2O(g) + 3H_2O(g)$ is

    (A) $K_c = \dfrac{[N_2O][H_2O]^3}{[NH_3][O_2]}$ (B) $K_c = \dfrac{[H_2O]^3\,[N_2O]}{[NH_3]^2[O_2]^2}$ (C) $K_c = \dfrac{[NH_3]^2\,[O_2]^2}{[N_2O][H_2O]^3}$ (D) $\dfrac{[NH_3][O_2]}{[N_2O][H_2O]}$

19. Hyper conjugation is possible in:

    (i) $\begin{matrix} H \\ H \end{matrix}\!\!>\!\!C = CH - CD_3$

    (ii) [cyclohexene ring]$-C = C<\begin{matrix} H \\ NH_2 \end{matrix}$ with H on upper carbon

    (iii) [benzene ring with CH_2Me substituent]$-C = C<\begin{matrix} H \\ H \end{matrix}$ with H on upper carbon

    (iv) [bicyclic ring with CH_3 groups top and bottom]

    (A) i and ii (B) i, ii and iii (C) only ii (D) in all the these

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20. IUPAC name of $H_3C - CH - CH_2 - CH - CH_2Cl$ is:

                                          | |

                                     C_2H_5 OH
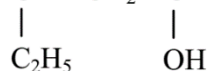
    (A) 1-chloro-4-methylhexan-2-al
    (B) 1-chloro-4-methylhexan-2-ol
    (C) 1-chloro-4-ethylpentan-2-ol
    (D) 1-chloro-2-hydroxy-4-methylhexane

21. $\langle O \rangle - COOH + NaH\overset{*}{C}O_3 \longrightarrow \langle O \rangle - COONa + CO_2$
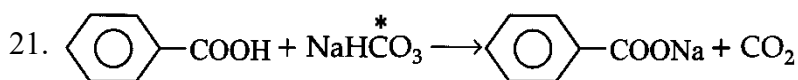
    C* is with in the product –

    (A) CO_2 (B) $\langle O \rangle - COONa$ (C) Both   (D) None of these

22. Polarisation may be called as the distortion of the shape of an anion by an adjacently placed cation. Which of the following statements is/are correct?
    (A) Lesser polarization is brought about by a cation of low radius
    (B) A large cation is likely to bring about a large degree of polarization
    (C) Larger polarisation is brought about by a cation of high charge
    (D) A small anion is likely to undergo a large degree of polarisation

23. pH of 10^{-7} M HCl solution is:
    (A) 7 – log2   (B) 7 – log 1.618   (C) 7   (D) 6.95

24. For which of the following K_p is less than K_c?
    (A) $N_2O_4 \rightleftharpoons 2NO_2$ (B) $N_2 + 3H_2 \rightleftharpoons 2NH_3$
    (C) $H_2 + I_2 \rightleftharpoons 2HI$ (D) $CO + H_2O \rightleftharpoons CO_2 + H_2$

25. Calculate pH of mixture of 400 ml of $\frac{1}{200}$ M Ba(OH)$_2$ 400 ml of $\frac{1}{50}$ M HCl and 200 ml of water:
    (A) 8.4   (B) 2.22   (C) 2.8   (D) None of these

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26. Boron reacts with nitric acid to form:
    (A) Sodium borate, H_2 (B) Boric acid   (C) Diborane   (D) Borax

27. The correct stereo chemical name of
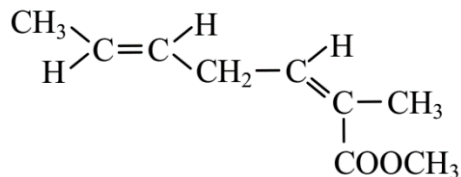
    (A) Methyl-2-methylhepta (2E, 5E) dienoate
    (B) Methyl-2-methylhepta (2Z, 5Z) dienoate
    (C) Methyl-2-methylhepta (2E, 5Z) dienoate
    (D) Methyl-2-methylhepta (2Z, 5E) dienoate

28. The wavelength associated with an electron equal to wavelength of proton would be …….. $\times 10^3$.
    (mass of $e = 9 \times 10^{-28}$ g; mass of proton $= 1.6725 \times 10^{-24}$ g)
    (A) 1.85   (B) 2.85   (C) 3.85   (D) 4.85

29. Which of the following is most stable carbocations?

    (A) $\overset{\oplus}{C}H_3$ (B) $CH_3–\overset{\oplus}{C}H_2$ (C) $CH_3 – \underset{\oplus}{\overset{O}{\underset{||}{C}}}$ (D) $CH_3 – \underset{CH_3}{\overset{CH_3}{C}} – \overset{\oplus}{C}H_2$

30. $CH_3–CH_2–CH_2–CH_3$. There is free rotation about ($C_2 \, \sigma \, C_3$) bond. The same most stable form is repeated after rotation of:
    (A) 60°   (B) 120°   (C) 240°   (D) 360°

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Biology (Section – C)

31. Animals are classified into hierarchical groups. In which one of the following, the largest number of species is found?
    (A) Genus   (B) Order   (C) Family   (D) Class

32. Which of the following groups of organisms are included under chrysophytes?
    (A) Diatoms and desmids   (B) Diatoms and dinoflagellates
    (C) Euglenoids and sporozoans   (D) Slime moulds and desmids

33. Red tides in warm coastal water develop due to the abundance of
    (A) dinoflagellates   (B) euglenoids
    (C) diatoms and desmids   (D) slime moulds

34. Which of the following groups does not belong to same class?
    (A) Rust, smut, mushrooms, bracket fungi
    (B) *Claviceps, Neurospora, Aspergillus,* morels, truffles and puffballs
    (C) Bread mould, *Moro, Albugo*
    (D) Both (A) and (B)

35. Which of the following animals have porous body and cellular level of organisation?
    (A) *Aurelia* and *Obelia*   (B) *Adamsia* and *Euspongia*
    (C) *Sycon* and *Spongila*   (D) *Sycon* and *Hydra*

36. Among the following organisms which is a completely non-parasitic form?
    (A) Sea anemone   (B) Tapeworm   (C) Leech   (D) Mosquito

37. Bilateral symmetry, segmentation, coelom and open circulatory system characterise which of the following phyla?
    (A) Annelida   (B) Mollusca   (C) Arthropoda   (D) Echinodermata

38. Which of the following is commonly called "pearl oyster"?
    (A) *Limulus*   (B) *Dentalium*   (C) *Pinctada*   (D) *Aurelia*

39. Unbranched, erect, cylindrical stout axis with distinct nodes and internodes and with jointed appearance is called as
    (A) runner   (B) sucker   (C) culm   (D) caudex

40. Inferior ovary is found in Family
    (A) Malvaceae   (B) Leguminoseae   (C) Compositeae   (D) Solanaceae

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41. In gramineae, the inflorescence is a
    (A) spadix   (B) racemose   (C) panicle   (D) cymose

42. Which of the following tissue systems constitutes bulk of the plant body?
    (A) Epidermal tissue system   (B) Ground tissue system
    (C) Vascular tissue system   (D) Both (A) and (C)

43. In _____ vascular bundle, a strip of vascular cambium is present in between the xylem and phloem.
    (A) open   (B) closed   (C) endarch   (D) exarch

44. Diagrammatic sketch of a certain type of connective tissue is given.
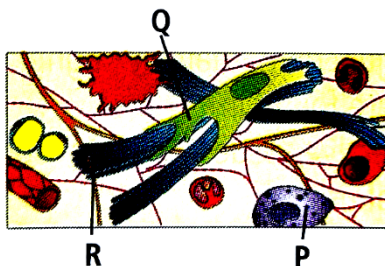
   Identify the parts labelled as P, Q and R and select the correct option.

P	Q	R
(A) Macrophage	Fibroblas	Collagen fibres
(B) Mast cell	Macrophage	Fibroblast
(C) Macrophage	Collagen fibre	Fibroblast
(D) Mast cell	Fibroblast	Collagen fibres

45. Which of the following is a wrongly matched pair?
    (A) Unicellular glandular cells   -   Goblet cell
    (B) Saliva   -   Exocrine secretion
    (C) Fusiform fibres   -   Smooth muscle
    (D) Cartilage   -   Areolar tissue

46. In frog, mesorchiumis a thin fold of membrane extending between
    (A) two testes   (B) liver and kidneys
    (C) two kidneys   (D) Kidneys sand testes

47. Which of the following chromosomes have almost equal arm?
    (A) Metacentric   (B) Acrocentric   (C) Polycentric   (D) Acentric

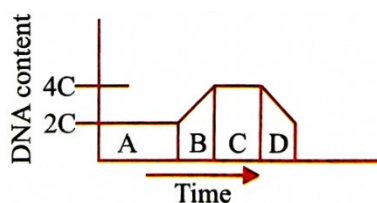-------------------------------------- *Rough* --------------------------------------

48. Select the mismatched pair.
    (A) Inulin – Fructose
    (B) Cellulose – Heteropolymer
    (C) Starch – Helical secondary structure
    (D) Chitin – Complex polysaccharide

(Case Based Questions No. 49)

  Human body contains many biomolecules like carbohydrates, fats, proteins and nucleic acids. In many of the carbon compounds in our body heterocyclic rings can be found. Refer to the given structures P and Q and answer the following questions.
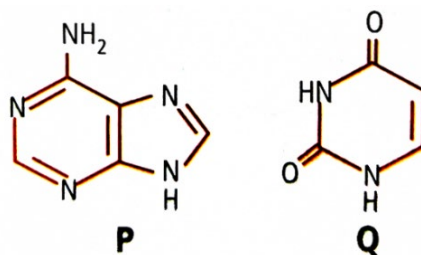
49. What does the given structures P and Q represent?
    (A) Nitrogen bases   (B) Nucleosides   (C) Nucleotides   (D) Nucleic acid

50. The given graph shows the change in DNA content during various phases (A to D) in a typical mitotic cell cycle. Identify the phases and select the correct option.

	A	B	C	D
(A)	G_2	G_1	S	M
(B)	G_2	S	G_1	M
(C)	G_1	S	G_2	M
(D)	M	G_1	S	G_2

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51. The cells that do not divide further, exit G_1 phase to enter an inactive stage called _____ of the cell cycle.
    (A) M stage   (B) G_2 stage   (C) S stage   (D) G_0 stage

52. In onion root tip during metaphase stage of mitosis the number of kinetochores will be
    (A) 4   (B) 8   (C) 16   (D) 32

53. During C_4 pathway, PEP combines with CO_2 in the presence of enzyme PEP Case, to form OAA. This process of initial fixation of CO_2 occurs in
    (A) mesophyll cells   (B) bundle sheath cells
    (C) both (A) and (B)   (C) none of these

54. Which of the following steps is associated with ATP formation (substrate level phosphorylation)?
    (A) Succinyl CoA → Succinic acid   (B) 1, 3 bisPGA → 3 PGA
    (C) PEP → Pyruvate   (D) All of these

55. What amount of energy is released from glucose during lactic acid fermentation?
    (A) Approximately 15%   (B) more than 18%
    (C) About 10%   (D) Less than 7%

56. How much quantity of CO_2 is delivered to alveoli in 5000 mL of deoxygenated blood?
    (A) 500 mL   (B) 4 mL   (C) 200 mL   (D) 40 mL

57. In which of the following diseases enough oxygen do not reach the heart muscle?
    (A) Cardiac arrest   (B) Angina   (C) Heart failure   (D) Heart attack

58. GFR of a healthy human being is
    (A) 125 L/day   (B) 125 mL/min   (C) 180 L/day   (D) both (B) and (C)

59. Which of the following is/are secreted by tubular cells during urine formation?
    (A) H^+ (B) K^+ (C) Ammonia   (D) All of these

60. Which of the following is a part of our brain?
    (A) Corpora allata   (B) Corpora adiposa
    (C) Corpora cardiaca   (D) Corpora quadrigemina

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