INDUS RANGERS DEFENCE ACADEMY

4TH Floor Shakumbhari Complex, Chetmani Near: IP Vijaya Mall Bhelupur Varanasi, (U.P.– 221010)

IMU–CET [WEEKLY TEST]
PRACTICE SHEET – 2

Time: 01:30 Hr **M. M.: 200**

General Instructions:

- There are 50 questions
- All questions have 4 marks for correct and –1 mark for wrong answer as a penalty.
- The name, date, and exam must be filled in OMR sheet otherwise the result will not be published.
- OMR fill should be properly.

[ENGLISH]

Each set of the following sentences comprises three alternatives A., B. and C. Choose the most suitable alternative in accordance with the correct use of tense:

1. A. By five o'clock yesterday I caught only one fish.
   B. By five o'clock yesterday I will have caught only one fish.
   C. By five o'clock yesterday I had caught only one fish.

2. A. After she had rested for a while she started on her journey.
   B. After she rested for a while she started on her journey.
   C. After she rested for a while she had started on her journey.

3. A. For the last six months I am working on the thesis.
   B. For the last six months I have been working on the thesis.
   C. For the last six months I have worked on the thesis.

4. A. I have been writing six letters since morning.
   B. I have written six letters since morning.
   C. I am writing six letters since morning.

5. A. He lived in London for two years when I went there.
   B. He was living in London for two years when I went there.
   C. He had been living in London for two years when I went there.

6. A. I don't think we met before.
   B. I don't think we have met before.
   C. I don't think we had met before.

7. A. The banks don't open on Sunday.
   B. The banks had not opened on Sunday.
   C. The banks are not opening on Sunday.

8. A. I saw two robbers who prowled near the well.
   B. I saw two robbers who are prowling near the well.
   C. I saw two robbers who were prowling near the well.

9. A. To this day I have not forgotten her good deeds.
   B. To this day I don't forget her good deeds.
   C. To this day I had not forgotten her good deeds.

10. A. How long are you reading this biography?
    B. How long have you read this biography?
    C. How long have you been reading this biography?

[MATHEMATICS]

Directions: Each of the following questions is followed by four alternatives. Choose the correct answer and mark your response accordingly.

11. If $\log_x a$, a^x and $\log_b x$ are in G.P., then what is x equal to?
    A. $\log_a(\log_b a)$ B. $\log_b(\log_a b)$
    C. $\frac{log_a(log_b a)}{2}$ D. $\frac{log_b(log_a b)}{2}$
12. If $2^c, 2^{ac}, 2^a$ are in G.P., then which one of the following is correct?
    A. a, b, c are in A.P. B. a, b, c are in G.P.
    C. a, b, c are in H.P. D. ab, bc, ca is in A.P.
13. The first and the second terms of an A.P. are $\frac{5}{2}$ and $\frac{23}{12}$ respectively. If n^{th} term is the largest negative term, what is the value of n?
    A. 5 B. 6 C. 7
    D. n cannot be determined

14. In an A.P., the first term is x and the sum of the first n terms is zero. What is the sum of next m terms?
    A. $\frac{mx(m+n)}{n-1}$ B. $\frac{mx(m+n)}{1-n}$ C. $\frac{nx(m+n)}{m-1}$ D. $\frac{nx(m+n)}{1-m}$
15. p, q, r and s are in A.P. such that p + s = 8 and qr = 15. What is the difference between largest and smallest numbers?
    A. 6 B. 5 C. 4 D. 3

Questions (16 – 17): Consider the following for the next two (02) items that follow.

Let sinβ be the G.M. of sinα and cosα; tanγ be the A.M. of sinα and cosα.

16. What is cos2β equal to?
    A. $(\cos\alpha - \sin\alpha)^2$ B. $(\cos\alpha + \sin\alpha)^2$
    C. $(\cos\alpha - \sin\alpha)^3$ D. $\frac{(\cos\alpha - \sin\alpha)^2}{2}$

17. What is the value of sec2γ?

A. $\frac{3-\sin 2\alpha}{5+2\sin 2\alpha}$ B. $\frac{5+\sin 2\alpha}{3-\sin 2\alpha}$

C. $\frac{3-2\sin 2\alpha}{4+\sin 2\alpha}$ D. $\frac{3-\sin 2\alpha}{4+3\sin 2\alpha}$

Questions (18 – 19): Consider the following for the next two (02) items that follow.

A quadratic equation is given by $\left(3+2\sqrt{2}\right)x^2-\left(4+2\sqrt{3}\right)x+\left(8+4\sqrt{3}\right)=0$

18. What is the H.M. of the roots of the equation?

A. 2 B. 4 C. $2\sqrt{2}$ D. $2\sqrt{3}$

19. What is the G.M. of the roots of the equation?

A. $\sqrt{2}\left(\sqrt{6}-\sqrt{3}+\sqrt{2}-1\right)$ B. $\sqrt{2}\left(\sqrt{6}+\sqrt{3}-\sqrt{2}-1\right)$

C. $(\sqrt{6}-\sqrt{3}+\sqrt{2}-1)$ D. $(\sqrt{6}+\sqrt{3}+\sqrt{2}-1)$

20. If G is the geometric mean of numbers 1, 2, 2^2, 2^3, …, 2^{n-1}, then what is the value of $1+2\log_2 G$?

A. 1 B. 4 C. n – 1 D. n

21. If H is the harmonic mean of numbers 1, 2, 2^2, 2^3, …, 2^{n-1}, then what is n/H equal to?

A. $2-\frac{1}{2^{n+1}}$ B. $2-\frac{1}{2^{n-1}}$ C. $2+\frac{1}{2^{n-1}}$ D. $2-\frac{1}{2^n}$

22. If the n^{th} term of sequence is $\frac{2n+5}{7}$, then what is the sum of its first 140 terms?

A. 2840 B. 2780 C. 2920 D. 5700

23. If (a + b), 2b, (b + c) are in H.P., then which one of the following is correct?

A. a, b and c are in A.P. B. a − b, b − c and c − a are in A.P.

C. a, b and c are in G.P. D. a − b, b − c and c − a are in G.P.

24. Let $t_1, t_2, t_3, \ldots$ be in G.P. What is $(t_1 t_3 \ldots t_{21})^{1/11}$ equal to?

A. t_{10} B. t^2_{10} C. t_{11} D. t^2_{11}

25. If a, b, c are in A.P.; b, c, d are in G.P.; c, d, e are in H.P., then which of the following is/are correct?

(i) a, c and e are in G.P.

(ii) 1/a, 1/c, 1/e are in G.P.

Select the correct answer using the code given below:

A. (i) only B. (ii) only

C. Both (i) and (ii) D. Neither (i) nor (ii)

[REASONING]

26. **Statements:**
All rice are wheat.
Some wheats are pulses.
No pulse is a vegetable.
Conclusions:
I. Some vegetables are rice.
II. Some pulses are rice.
III. Some vegetables are wheat.
A. None of the conclusions follow.
B. Both conclusions I and II follow.
C. Both conclusions II and III follow.
D. All conclusions follow

27. **Statements:**
All machines are factories.
Some factories are shops.
Some shops are houses.
Conclusions:
I. Some houses are factories.
II. Some machines are houses.
III. Some factories are machines.
A. Only conclusion II follows.
B. Only conclusion I follows.
C. All conclusions follow.
D. Only conclusion III follows.

28. **Statements:**
All leathers are shoes.
Some bags are shoes.
Some bags are papers.
Conclusions:
I. Some papers are leathers.
II. Some shoes are leathers.
III. Some shoes are papers.
A. Only conclusion II follows.
B. Only conclusion I follows.
C. Only conclusion III follows.
D. All conclusions follow.

29. **Statements:**
All cricketers are wealthy.
Some wealthy are Indians.
All Indians are honest.
Conclusions:
I. All Indians are cricketers.
II. Some cricketers are honest.
A. Only conclusion II follows.
B. Only conclusion I follows.
C. Neither conclusion I nor II follows.
D. Both conclusions I and II follow.

30. **Statements:**
Some mirrors are glass.
All glass are taps.
Some taps are pens.
Conclusions:
I. Some glass are mirrors.
II. All taps are glass.
III. Some pens are taps.
A. Only conclusions II and III follow.
B. Only conclusions I and II follow.
C. Only conclusions I and III follow.
D. None of the conclusions follow.

31. **Statements:**
Some laptops are phones.
Some phones are capsules.
Some capsules are pens.
Conclusions:
I. Some laptops are capsules.
II. Some phones are pens.
III. Some pens are capsules.
IV. Some pens are phones.
A. Only conclusions II and IV follow.
B. Only conclusions II and III follow.
C. Only conclusion I follows.
D. Only conclusion III follows.

32. **Statements:**
All blocks are toys.
All toys are books.
All books are stories.
Conclusions:
I. Some toys are blocks.
II. Some blocks are books.
III. Some stories are toys.
A. Only conclusions I and III follow.
B. Only conclusions II and III follow.
C. Only conclusions I and II follow.
D. All the conclusions follow.

33. **Statements:**
All plates are bowls.
No bowl is a glass.
Some glasses are vessels.
Conclusions:
I. Some glasses are plates.
II. Some bowls are plates.
III. Some vessels are bowls.
A. Both conclusions II and III follow.
B. Both conclusions I and II follow.
C. Only conclusion II follows.
D. Only conclusion I follows.

34. **Statements:**
All bottles are containers.
Some containers are buckets.
All buckets are soaps.
Conclusions:
I. Some soaps are bottles.
II. Some buckets are bottles.
III. Some soaps are containers.
A. Only conclusion I follows.
B. All conclusions follow.
C. Only conclusion II follows.
D. Only conclusion III follows.

35. **Statements:**
All birds are ducks.
Some ducks are crows.
All crows are parrots.
Conclusions:
I. Some parrots are birds.
II. Some parrots are ducks.
III. Some crows are birds.
IV. All parrots are birds.
A. Only conclusion II follows.
B. Only conclusions I, II and IV follow.
C. Only conclusions II and III follow.
D. Only conclusions I and IV follow.

36. **Statements:**
All chocolates are sweets.
Some sweets are harmful.
Conclusions:
I. All chocolates are harmful.
II. Some harmful are chocolates.
A. Both conclusions I and II follow.
B. Only conclusion I follows.
C. Only conclusion II follows.
D. Neither conclusion I nor II follows.

37. **Statements:**
All rags are carpets.
Some carpets are steel.
Some steel are bottles.
Conclusions:
I. All carpets are rags.
II. Some carpets are bottles.
A. Both conclusions I and II follow.
B. Neither conclusion I nor II follows.
C. Only conclusion I follows.
D. Only conclusion II follows.

38. **Statements:**
All TVs are radios.
Some radios are dryers.
All dryers are hot.
Conclusions:
I. Some TVs are radios.
II. Some dryers are TVs.
A. Only conclusion I follows.
B. Both conclusions I and II follow.
C. Neither conclusion I nor II follows.
D. Only conclusion II follows.

39. **Statements:**
Some cows are animals.
All animals are big.
No big is a mobile.
Conclusions:
I. All cows are animals.
II. No big is an animal.
A. Only conclusion I follows.
B. Both conclusions I and II follow.
C. Only conclusion II follows.
D. Neither conclusion I nor II follows.

40. **Statements:**
All bed are covers.
Some covers are thick.
Some thick is juice.
Conclusions:
I. All covers are beds.
II. Some thick are covers.
A. Both conclusions I and II follow.
B. Only conclusion II follows.
C. Neither conclusion I nor II follows.
D. Only conclusion I follows.

[PHYSICS]

41. The resistance of a wire is R ohm. If it is melted and structured to n times its original length. Its new resistance will be –
A. $\frac{R}{n}$ B. n^2R C. $\frac{R}{n^2}$ D. nR

42. A wire of a certain material is structured to twice its original length. The resistance of structured wire would be – If resistance of wire is R –
A. 16 R Ω B. 2 R Ω C. 4 R Ω D. 8 R Ω

43. Specific Resistance of conductor increases with
A. Increase in temperature
B. Increase in cross section area
C. Increase in cross section and decrease in length
D. Decrease in cross section area

44. The masses of the wires of copper is in the ratio of 1:3:5 and their lengths are in the ratio of 5:3:1. The ratio of their electrical resistance is

A. 1:3:5 B. 5:3:1 C. 1:25:125 D. 125:15:1

45. The unit of permittivity of free space is

A. $\frac{NM^2}{C^2}$ B. $\frac{C^2}{NM^2}$ C. $\frac{C^2}{(NM)^2}$ D. $\frac{C}{NM}$

46. Electric field at the equator of a dipole is E. If strength and distance is now doubled then the electric field will be –

A. $\frac{E}{2}$ B. $\frac{E}{8}$ C. $\frac{E}{4}$ D. E

47. Two charged spherical conductors of a radius R_1 and R_2 are connected by a wire, then the ratio of surface charge density of the sphere $\frac{\sigma_1}{\sigma_2}$ is

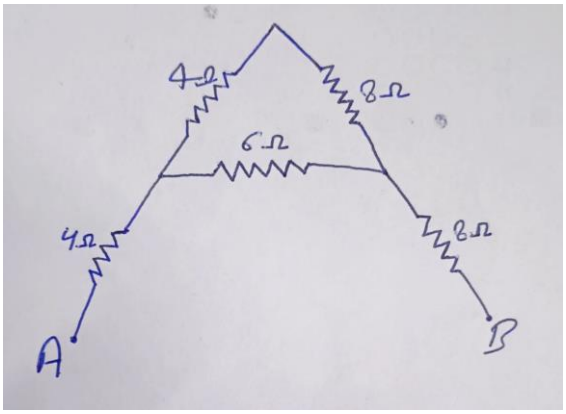
A. $\frac{R_2}{R_1}$ B. $\sqrt{\frac{R_1}{R_2}}$ C. $\frac{R_1^2}{R_2^2}$ D. $\frac{R_1}{R_2}$

48. A wire 50 cm long and $1mm^2$ in cross section carries a current of 4A when connect to a 2V battery. The resistivity of the wire is –

A. 4×10^{-6} ΩM B. 1×10^{-6} ΩM

C. 2×10^{-7} ΩM D. 5×10^{-7} ΩM

49. The equivalent resistance between AB –



A. 16 Ω B. 30 Ω C. 4.8 Ω D. 7.2 Ω

50. A charged particles having drift velocity of 7.5×10^{-4} m/s in an electric field of 3×10^{-10} Vm^{-1} has a mobility –

A. 2.5×10^{6} B. 2.5×10^{-6} C. 2.25×10^{-15} D. 2.25×10^{15}