PACE-IIT & MEDICAL

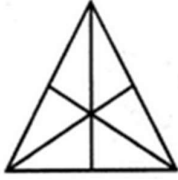## Section : 1 - Aptitude and Logical Reasoning

1. Find the number of triangles

(a) 16   (b) 13   (c) 9   (d) 7

2. A man has a certain number of small boxes to pack into parcels. If he packs 3, 4, 5 or 6 in a parcel, he is left with one over. If he packs 7 in a parcel, none is left over. What is the number of boxes he may have to pack ?
(a) 106   (b) 301   (c) 309   (d) 399

3. In a caravan, in addition to 50 hens, there are 45 goats and 8 camels with some keepers. If the total number of feet be 224 more than the number of heads in the caravan, then the number of keepers is
(a) 5   (b) 8   (c) 10   (d) 15

4. Shikha is the mother-in-law of Ekta who is the sister-in-law of Ankit. Pankaj is the father of Sanjay, the only brother of Ankit. How is Shikha related to Ankit ?
(a) Mother-in-law   (b) Aunt   (c) Wife   (d) Mother

5. A monkey climbs 30 feet at the beginning of each hour and rests for a while when he slips back 20 feet before he again starts climbing in the beginning of the next hour. If he begins his ascent at 8.00 a.m., at what time will he first touch a flag at 120 feet from the ground ?
(a) 7 p.m.   (b) 5 p.m.   (c) 6 p.m.   (d) 8 p.m.
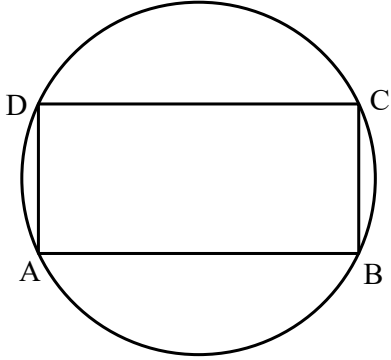
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Section : 2 - Mathematics

6.   Which of the following statement is false:

(a) $\dfrac{7\pi}{22}$ is an irrational number

(b) $\left(\dfrac{7\pi}{22}\right)^2$ is an irrational number

(c) $\sqrt{\left(5+\sqrt{7}\right)^2}+\sqrt{\left(5-\sqrt{7}\right)^2}$ is a rational number

(d) $\sqrt{\left(5+\sqrt{7}\right)^2}-\sqrt{\left(5-\sqrt{7}\right)^2}$ is an irrational number

7.   Solve for x: $x^2+\dfrac{7}{x-3}=9+\dfrac{7}{x-3}$

(a) x = 3 or x = –3   (b) x = 3   (c) x = – 3   (d) None of these

8.   Evaluate: $\sqrt{71-\sqrt{54-\sqrt{29-\sqrt{16}}}}$

(a) 5   (b) 6   (c) 8   (d) 9

9. $\dfrac{5^{5001}+5^{4999}}{5^{5000}-5^{4998}}=$

(a) 8/9   (b) 65/12   (c) 12/7   (d) 49/3

10. If mean of 8 observations is 5 & mean of another 2 observations is 10. Then the mean of combined 10 observations is

(a) 5   (b) 6   (c) 7   (d) 8

11. If $y^4+\dfrac{1}{y^4}=2,$ then the value of $y^{100}+\dfrac{1}{y^{100}}=$

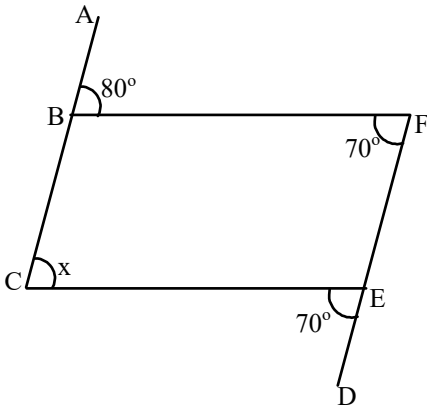(a) 2^{100} (b) 2^{50} (c) $2^{12.5}$ (d) 2

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12. Find the area of shaded region where ABCD is a square of side length 3 m.

(a) $\dfrac{9\pi}{2}-9$ (b) $\dfrac{6\pi}{9}+9$ (c) $\dfrac{4\pi}{3}-4$ (d) $\dfrac{9\pi}{2}+5$

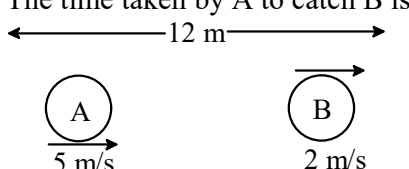13. ABC & DEF are straight lines.
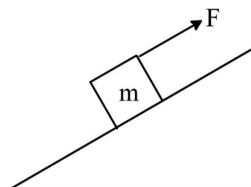

Find the value of x.
(a) 60º   (b) 70º   (c) 75º   (d) 80º

14. Cost of 9 pens is Rs. 72, then the cost of 30 pens is:
(a) 180   (b) 200   (c) 240   (d) 270

15. If Rs. 1200 is divided among three people A, B & C in the ratio 4 : 7 : 9, then the difference in the amount of C & A will be
(a) 100   (b) 200   (c) 300   (d) 400

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Section : 3 - Science

16. A block lying on the floor won't move unless external force on the block is _____ static friction.
    (a) Less than   (b) More than   (c) Equal to   (d) Exactly half of

17. Loudness of sound is determined by which property of sound wave?
    (a) Frequency   (b) Wavelength   (c) Amplitude   (d) Speed

18. Sound travels in the solid medium and enters the liquid medium then which quantity changes
    (a) Wavelength   (b) Speed   (c) Frequency   (d) Both (a) and (b)

19. The time taken by A to catch B is

    (a) 2 sec   (b) 3 sec   (c) 4 sec   (d) 5 sec

20. Value of kinetic/dynamic friction doesn't depend on
    (a) Mass of block   (b) Surface material of block
    (c) Floor material   (d) Velocity of block

21. When water freezes into ice, energy is
    (a) Absorbed by water   (b) Released
    (c) First absorbed then released   (d) None of these

22. The ratio of distance and magnitude of displacement is
    (a) ≥ 1 (b) ≤ 1 (c) $= 1$ (d) $= -1$

23.

    Friction force on m can be
    (a) Up the inclined   (b) Down the inclined   (c) Zero   (d) All of these

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24. Thrust on the surface is equal to
    (a) $\dfrac{Pressure}{Area}$ (b) Pressure $\times$ Area   (c) $\dfrac{Area}{Pressure}$ (d) None

25. Light year is a unit of
    (a) Time   (b) Mass   (c) Speed   (d) Distance

26. Hydrogen is a very good fuel because
    (a) It has highest calorific value
    (b) Burning of hydrogen does not cause any pollution
    (c) Hydrogen can be easily prepared by the electrolysis of water
    (d) All of these

27. The substance that forms a flame on burning is
    (a) Iron   (b) Camphor   (c) Aluminium   (d) Charcoal

28. In which zone of a candle flame does complete combustion takes place?
    (a) Inner   (b) Outer   (c) Middle   (d) All three zones

29. Which of the following is not a petroleum product?
    (a) Kerosene   (b) Gasoline   (c) Asphalt   (d) Bees wax

30. CNG stands for
    (a) Conventional natural gas   (b) Coal and natural gas
    (c) Compressed natural gas   (d) Commercial natural gas

31. Oxide formed by an element X turns blue litmus red. Element X is-
    (a) Phosphorous   (b) Sodium   (c) Iron   (d) Copper

32. The metal which reacts with water only when it is red hot and steam is passed over it is
    (a) Sodium   (b) Calcium   (c) Iron   (d) Magnesium

33. Which of the following polymer is used in making ketchup bottles?
    (a) Poly propylene (PP)   (b) Polystyrene (PS)
    (c) Poly vinyl chloride (PVC)   (d) Polyethene

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34. Which of the following is a thermosetting plastics?
    (a) Bakelite
    (b) Polystyrene
    (c) Polyethene
    (d) Polyvinyl chloride

35. What is the chemical formula of aluminium sulphate?
    (a) $A\ell SO_4$
    (b) $A\ell S_2$
    (c) $A\ell_2(SO_4)_3$
    (d) $A\ell S_2O_3$

36. The practice of growing two or more dissimilar crops in the same field one after another is
    (a) Crop rotation
    (b) Tilling
    (c) Plantation
    (d) Weeding

37. The ideal months for harvesting kharif crop are
    (a) June/July
    (b) August/September
    (c) September/October
    (d) November/December

38. Microorganisms that causes disease are also known as
    (a) Pathogens
    (b) Fungi
    (c) Antigen
    (d) Microbes

39. Bacilli are the bacteria that are
    (a) Rod-shaped
    (b) Comma-Shaped
    (c) Curved-shaped
    (d) Spiral

40. Deforestation leads to
    (a) An increase in the temperature of the earth
    (b) Imbalance of O_2 and CO_2
    (c) Increase in rainfall
    (d) Both a and b

41. The variety of organisms living on the earth, is referred to as
    (a) Biodiversity
    (b) Food chain
    (c) Lithosphere
    (d) Relationship

42. Which of the following is a unicellular organisms?
    (a) Squid
    (b) Amoeba
    (c) Earthworm
    (d) Hydra

43. The fusion of sperm and ova usually occur in the
    (a) Ovary
    (b) Uterus
    (c) Testes
    (d) Oviduct

44. Sets of reproductive terms are given below. Choose the set that has an incorrect combination.
    (a) Sperm, testis, sperm duct, penis
    (b) Menstruation, egg, oviduct, uterus
    (c) Sperm, oviduct, egg, uterus
    (d) Ovulation, egg, oviduct, uterus

45. Thyroxine hormone is produced by adrenal gland
    (a) Adrenal gland
    (b) Testes
    (c) Pituitary gland
    (d) Thyroid gland

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