Set: Msc. Practice Test - Set B

1. Improved technology and equipment often result in fewer injuries during high-risk activities such as rock climbingand scuba diving. But participant education also plays a large role in reducing the number of injuries sustainedduring these activities. People who are poorly trained in these activities run a much higher risk of injury even if provided with the latest and best equipment. Which of the following can be properly inferred from the information above?
a. Rock climbing and scuba diving are more risky than any other activities.
b. Training is a more important safety factor than equipment in high-risk activities.
c. People who are properly trained in their activities do not sustain injuries.
d. The safety benefits of the latest equipment can be offset by inadequate preparation.

2. Calories consumed in excess of those with which the body needs to be provided to maintain its weight are normally stored as fat and the body gains weight. Alcoholic beverages are laden with calories. However, those people who regularly drink two or three alcoholic beverages a day and thereby exceed the caloric intake necessary to maintain their weight do not in general gain weight. Which one of the following, if true, most helps to resolve the apparent discrepancy?
a. Some people who regularly drink two or three alcoholic beverages a day avoid exceeding the caloric intake necessary to maintain their weight by decreasing caloric intake from other sources.
b. Many people who regularly drink more than three alcoholic beverages a day do not gain weight.
c. Excess calories consumed by people who regularly drink two or three alcoholic beverages a day tend to be dissipated as heat.
d. Some people who do not drink alcoholic beverages but who eat high-caloric foods do not gain weight.

3. Studies in restaurants show that the tips left by customers who pay their bill tend to be larger when the bill is presented with the server's name hand-written on the bill. Psychologists hypothesize that simply seeing a handwritten name makes many consumers feel more of a personal identification with the server, encouraging larger tips. Which of the following, if true, most strongly supports the psychologists' interpretation of the studies?
a. The effect noted in the studies applies to patrons paying with either credit cards or cash.
b. Greeting card companies have found that charities which send holiday cards with handwritten signatures are more likely to receive donations than those which send cards with printed signatures.
c. Many of the restaurants in which the studies were conducted are located in tourist areas, where people are traveling for leisure activities.
d. The studies indicated much larger average tips if the customer ordered alcoholic beverages with his or her meal.

4. Albinism is a rare genetic condition that inhibits the production of melanin, or pigmentation, in the skin and hair. People born with albinism are unusually susceptible to sunburn, melanoma, and a range of other health issues that are generally connected to excessive exposure to the sun. The statements above, if true, provide the most support for which of the following conclusions?
a. When a non-albino person gets sunburn, the amount of melanin produced by that person decreases.
b. It is not possible for a person born with albinism to adopt other artificial protective measures against excessive exposure to the sun.
c. In humans, melanin plays a role in protecting the skin from developing sunburn and other sun-related ailments.
d. Humans with a high production of melanin can easily ignore health issues related to exposure to the sun.

5. Some environmentalists question the prudence of exploiting features of the environment, arguing that there are no economic benefits to be gained from forests, mountains, or wetlands that no longer exist. Many environmentalists claim that because nature has intrinsic value it would be wrong to destroy such features of the environment, even if the economic costs of doing so were outweighed by the economic costs of not doing so. Which one of the following can be logically inferred from the passage?
a. Most environmentalists appeal to economic reasons in questioning the defensibility of exploiting features of the environment.
b. It is economically imprudent to exploit features of the environment.
c. Some environmentalists appeal to a non-economic justification in questioning the defensibility of exploiting features of the environment.
d. Many environmentalists provide only a non-economic justification in questioning the defensibility of exploiting features of the environment.

6. The least perfect square, which is divisible by each of 21, 36 and 66 is:
a. 214434
b. 213444
c. 214344
d. 231444

7. Sakshi can do a piece of work in 20 days. Tanya is 25% more efficient than Sakshi. The number of days taken by Tanya to do the same piece of work is:
a. 15
b. 18
c. 25
d. 16

8. The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?
a. Rs. 2000
b. Data inadequate
c. Rs. 2400
d. Rs. 2200

9. The cube root of 0.000216 is:
a. 77
b. 0.06
c. 87
d. 0.6

10. A and B can complete a work in 15 days and 10 days respectively. They started doing the work together but after 2 days B had to leave and A alone completed the remaining work. The whole work was completed in :
a. 15 days
b. 8 days
c. 10 days
d. 12 days

11. the number of ways in which 3 prizes can be distributed among 4 boys when a boy may get any number

of prizes is:

a. 3!.4!

b. 32

c. 64

d. 4!

12. The letters of the word Calcutta and America are arranged in all possible ways. The ratio of the number of the number of arrangements is:

a. 3:2

b. 2:1

c. 5:2

d. 4:3

13. In how many ways can 5 red and 4 white balls be drawn from a bag containing 10 red and 8 white balls?

a. $^8C_5 \times ^{10}C_4$

b. None

c. $^{10}C_5 \times ^8C_4$

d. $^{18}C_9$

14. The number of committee that can be formed from 12 men and 8 women which consists of 3 men and 2 women is:

a. 5210

b. 6160

c. 3120

d. 4120

15. The number of ways in which a team of 11 players can be selected from 22 players including 2 of them and excluding 4 of them is:

a. $^{16}C_{11}$

b. $^{16}C_9$

c. $^{16}C_5$

d. $^{20}C_9$

16. $\lim_{x \to 0} \dfrac{1 - cos3x}{1 - cos4x}$

a. 16/9

b. 9/16

c. 3/4

d. 6/15

17. $\lim_{x \to 0} \left(\dfrac{1 + 2x}{1 - 3x}\right)^{1/x}$

a. e^3

b. e^2

c. e^4

d. e^5

18. $\lim\limits_{x\to 64} \dfrac{\sqrt[6]{x}-2}{\sqrt[3]{x}-4}$

a. -1
b. 0
c. 1
d. none

19. $\lim\limits_{x\to 0} \dfrac{2}{x}log(1+x)$

a. 2
b. e^2
c. 1
d. e

20. $\lim\limits_{x\to\infty} \dfrac{2^{-x}}{2^x}$

a. 0
b. 1
c. ∞
d. -1

21. $\lim\limits_{y\to 0} \dfrac{(x+y)sec(x+y)-xsecx}{y}$

a. xtanx+secx
b. xtan^{2}x+2secx
c. xsecx+tanx
d. secx(xtanx+1)

22. $\lim\limits_{x\to\infty} \left(\dfrac{x^2+5x+3}{x^2+x+3}\right)^{1/x}$

a. 1
b. e^3
c. e^4
d. e^2

23. $\lim\limits_{x\to e} \dfrac{logx-1}{x-e}$

a. 0
b. e
c. 1
d. 1/e

24. $\lim\limits_{n\to\infty} \dfrac{1+2+3+.......+n}{n^2} =$

a. 1/2
b. 1/6

c. 1/3

d. 1/4

25. $\lim\limits_{x \to 0} \dfrac{\log_e(1+x)}{3^x - 1}$

a. 1

b. 0

c. $\log_3 e$

d. $\log_e 3$

26. A function f(x) defined by $f(x) = 2x + 1 \, for \, x < 1$ $= p \, for \, x = 1$ $= 3x \, for \, x > 1$ is continuous at x=1 then the value of 'p' is

a. 2

b. 1/2

c. 3/2

d. 3

27. $\lim\limits_{x \to 0} \dfrac{sin|x|}{|x|} =$

a. 1

b. -1

c. doesnot exist

d. 0

28. $\lim\limits_{x \to \infty} x^2 \sin\dfrac{1}{x}$

a. none of these

b. 0

c. ∞

d. 1

29. $\lim\limits_{x \to 0} \dfrac{\log(1+x)}{x}$

a. 1

b. 0

c. ∞

d. -1

30. $\lim\limits_{x \to 0} \sin\dfrac{1}{x}$

a. non-existent

b. ∞

c. -1

d. 1

31. $\lim\limits_{x \to 0} \dfrac{e^x - (1+x)}{x^2}$

a. 0
b. 1/2
c. 1/4
d. 1

32. $\lim\limits_{x \to 0} \dfrac{sinax - sinbx}{x} =$

a. 1
b. 2
c. a-b
d. 0

33. $\lim\limits_{x \to \infty} \dfrac{4 - x^2}{4x^2 - x - 2}$

a. 2
b. -1/4
c. -2
d. 1

34. $\lim\limits_{x \to 0} \dfrac{e^x - x - 1}{x} =$

a. 0
b. 1
c. e
d. -1

35. $\lim\limits_{x \to \pi/6} \dfrac{cot^2\theta - 3}{cosec\theta - 2}$

a. 2
b. 1/2
c. 4
d. 1

36. if the roots of the equation $x^2+x+1=0$ are ? and ?, then the value of $?^2+?^2=$
a. 1
b. -1
c. 2
d. 0

37. If $x^2+x+1=0$ then the value of x^{3n}:
a. 1
b. 3
c. -1
d. 0

38. if α,β be the roots of the equation $(x-a)(x-b)=c$, c is not equal to 0 then the roots of the equation $(x-\alpha)(x-\beta)+c=0$ are
a. a,b
b. α,β
c. b,c
d. c,a

39. The least integer k which makes the roots of the equation $x^2+5x+k=0$ imaginary is
a. 5
b. 4
c. 7
d. 6

40. If the roots of $a_1x^2+b_2x+c_1=0$ are α_1 and α_2 and those of $a_2x^2+b_2x+c_2=0$ are β_2 and β_2 such that $\alpha_1\beta_2=\alpha_1\beta_2=1$, then
a. 5
b. 7
c. 6
d. 4

41. One of the root of the equation $3x^2+px+3=0$ is square of the other, then p=
a. $\dfrac{1}{3}$
b. 3
c. $\dfrac{2}{3}$
d. 1

42. If the roots of the equation $x^2+x+1=0$ are α and β and the roots of the equation $x^2+px+q=0$ are $\dfrac{\alpha}{\beta}$ and $\dfrac{\beta}{\alpha}$ then p=
a. $\dfrac{1}{2}$
b. 2
c. 1
d. -1

43. if α and β are the roots of the equation $x^2-p(x+1)-c=0$, then $(1+\alpha)(1+\beta)$ equals
a. 1-c
b. 1+c

c. 1-p
d. 1+p

44. If α,β are the roots of the equation $x^2+5x+3=0$ then the equation $3x^2+5x+1=0$ has a root

a. $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

b. $\dfrac{1}{\alpha} \ or \ \dfrac{1}{\beta}$

c. $\dfrac{\alpha + \beta}{\alpha\beta}$

d. ⚠ Invalid Equation

45. If the roots of the equation $x^2+x+1=0$ are α and β then the value of $\alpha^2+\beta^2=$
a. 0
b. -1
c. 2
d. 1

46. Which from the following set has closure property w.r.t addition ?
a. {1}
b. {1, 1}
c. {0}
d. {1, -1}

47. Which from the following set has closure property with respect to multiplication ?
a. {1,-1}
b. {0,-1}
c. {0,-1}
d. {-1,-1}

48. The shaded region of the venn diagram is represented by?
a. B'
b. A'
c. A - B
d. B - A

49. The logical form of (A ? B)' = A' ? B' is?
a. ~(p ? q) = ~p ? ~ q
b. ~(p ? q) = ~p ? ~ q
c. ~p ? ~q = ~(p ? q)
d. ~p ? ~q = ~(p ? q)

50. If the set G={1,w,w^2} is an abelian group w.r.t multiplication, then inverse of w is ?
a. w
b. 1
c. it does not contain an inverse

d. w^2

51. If the number of elements in a set S are 5. Then the number of elements of the power set P(S) are ?
a. 32
b. 6
c. 16
d. 5

52. A short masonry pillar is 60 cm x 60 cm in cross-section, the core of the pillar is a square whose side is
a. 10.32 cm
b. 20.00 cm
c. 14.14 cm
d. 22.36 cm

53. If the beam is supported so that there are only three unknown reactive elements at the supports. These can be determined by using the following fundamental equation of statics
a. ?H = 0
b. ?H = 0; ?V = 0; ?M = 0
c. ?H = 0; ?H = 0
d. ?V = 0

54. A joint of a frame is subjected to three tensile force P, Q and R equally inclined to each other. If P is 10 tonnes, the other forces will be
a. R + 10 tonnes and Q = zero
b. Q and R each is equal to 10 tonnes
c. Q + R = 10 tonnes
d. Q = 10 tonnes and R = zero

55. The areas of cross-section of a square beam and a circular beam subjected to equal bending moments, are same.
a. circular beam is more economical
b. both the beams are equally economical
c. both the beams are equally strong
d. square beam is more economical

56. Shear strain energy theory for the failure of a material at elastic limit, is due to
a. St. Venant
b. Von Mises
c. Rankine
d. Guest or Trecas

57. A composite beam is composed of two equal strips one of brass and other of steel. If the temperature is raised
a. steel experiences tensile force
b. brass experiences compressive force
c. All the above
d. composite beam gets subjected to a couple

58. The strain energy due to volumetric strain
a. is directly proportional to the square of exerted pressure
b. all the above
c. is inversely proportional to Bulk modulus
d. is directly proportional to the volume

59. Principal planes are subjected to
a. tangential stresses only
b. normal stresses as well as tangential stresses
c. none of these
d. normal stresses only

60. In plastic analysis, the shape factor for rectangular section, is
a. 1.5
b. 1.4
c. 1.6
d. 1.7

61. The locus of reaction of a two hinged semi-circular arch, is
a. circle
b. parabola
c. straight line
d. hyperbola

62. By applying the static equations i.e. ?H = 0, ?V = 0 and ?M = 0, to a determinate structure, we may determine
a. supporting reactions only
b. all the above
c. bending moments only
d. shear forces only

63. The assumption in the theory of bending of beams, is :
a. Young's modulus is same in tension as well as in compression
b. material is homogeneous
c. material is isotropic
d. all the above

64. A saturated soil sample has water content of 40% and specific gravity of soil particles 2.7. The void ratio

of the soil, is
a. 1.08
b. none of these
c. 0.52
d. 0.4

65. Pick up the correct statement from the following:
a. All the above.
b. Kaolinite is most stable clay
c. Kaolinite shows a very little sign of swelling on wetting
d. Kaolinite when wet, becomes moderately plastic because negative electro magnetic charges on platelets attrack water

66. Pick up the correct statement from the following:
a. The line joining the peak of three moisture content graphs obtained by using three compactive energies, is called line of optimus
b. The dry density reduces by addition of water after attaining optimum moisture content
c. Well graded coarse grained soils can be compacted to a very high density as compared to fine grained soils
d. All the above

67. Water formed transported soil is
a. alluvial
b. marine
c. loess.
d. lacustrine

68. According to the Indian Standards the specific gravity is the ratio of the unit weight of soil solids to that of water at a temperature of
a. 30°
b. 17°C
c. 27°C
d. 23°C

69. The pressure that builds up in pore water due to load increment on the soil, is termed
a. excess pore pressure
b. excess hydrostatic pressure
c. all the above
d. hydrodynamic pressure

70. Accurate determination of water content, is made by
a. calcium carbide method
b. oven-drying method
c. alcohol method
d. sand bath method

71. When drainage is permitted under initially applied normal stress only and full primarily consolidation is

allowed to take place, the test is known as
a. none of these.
b. quick test
c. drained test
d. consolidated undrained test

72. A coarse-grained soil has a voids ratio 0.75, and specific gravity as 2.75. The critical gradient at which quick sand condition occurs, is
a. 0.25
b. 1.00
c. 0.75
d. 0.50

73. According to the Indian Standards the specific gravity is the ratio of the unit weight of soil solids to that of water at a temperature of
a. 23°C
b. 17°C
c. 27°C
d. 30° c

74. The factor which affects the compaction, is
a. type of soil
b. compacting content
c. moisture content
d. All the above

75. A partially saturated sample of soil has a unit weight of 2.0 g/cm3 and specific gravity of soil particles is 2.6. If the moisture content in the soil is 20%, the degree of saturation is
a. none of these
b. 92%
c. 20%
d. 77%

List of Answers:

1. d	2. c	3. b	4. c	5. c	6. b	7. d	8. a	9. b	10. d	11. c	12. b
13. c	14. b	15. b	16. b	17. d	18. c	19. a	20. a	21. d	22. a	23. c	
24. a	25. c	26. d	27. a	28. c	29. a	30. a	31. b	32. c	33. b	34. a	
35. c	36. b	37. a	38. a	39. c	40. b	41. b	42. c	43. a	44. b	45. b	
46. c	47. a	48. b	49. b	50. d	51. a	52. c	53. b	54. b	55. d	56. b	
57. a	58. b	59. d	60. a	61. c	62. b	63. d	64. c	65. a	66. d	67. c	
68. c	69. c	70. b	71. d	72. b	73. c	74. d	75. b				