

1. Diameter range is high in geometric progression due to _____ spindle speed.

- a. Low
- b. High
- c. Constant
- d. None of the above

Ans: a

2. What is harmonic progression?

- a. Difference between reciprocal of two successive spindle speeds is constant
- b. Difference between two successive spindle speeds is constant
- c. Ratio of two successive spindle speeds is constant.
- d. Ratio of two successive spindle speeds is variable.

Ans: a

3. Ratio of two spindle speeds is constant in _____ progression.

- a.Arithmetic
- b.Geometric
- c.Harmonic
- d.None of the above

Ans: b

4. What is the purpose of using a gear box?

- a.To increase torque
- b.To increase speed
- c.Convert single input speed into multiple output speeds
- d.All of the above

Ans: d

5. Which of the following statements is true for structure/speed diagrams?

- a.Structure diagrams gives range ratio of spindle speeds
- b.Speed diagrams do not give range ratio of spindle speeds
- c.Speed diagrams consider motor speed
- d.All of the above

Ans: b

6. What is the maximum percentage loss of economic cutting speed if geometric progression ratio = 1.06 ?

- a. 17.0 %
- b. 11.5 %
- c. 5.7 %
- d. 2.9 %

Ans: d

7. A machine tool has minimum speed of 100 r.p.m. How many speed steps are required by it to achieve speed of 200 rpm? (Geometric progression ratio = 1.06)

- a. 11
- b. 12
- c. 13
- d. 14

Ans: b

8. Maximum and minimum diameter of a shaft to be machined is 100 mm and 80 mm respectively. What is the maximum spindle speed if cutting velocity is 40 m/min?

- a. 120 r.p.m
- b. 127 r.p.m
- c. 160 r.p.m.
- d. 636 r.p.m.

Ans: c

9. Economic cutting speed is minimum if geometric ratio is _____

- a. Minimum
- b. Maximum
- c. Equal to economic cutting speed
- d. None of the above

Ans: a

10. What is the geometric progression ratio if maximum and minimum spindle speeds are 500 r.p.m and 300 r.p.m respectively? (Number of speed steps = 7)

- a. 0.91
- b. 1.5

c.1.08

d.2.0

Ans: c

11. In machine tool gear box, optimum number of speed steps with increments between---

- a. 5 to 10 %
- b. 10 to 15 %
- c. 15 to 20 %
- d. 20 to 25 %

Ans: c

12. In case of single speed gear box for every input speed there is/are only -----output speed.

- a. Three
- b. Two
- c. One
- d. None of the above

Ans: c

13. In arithmetic progression the-----between any two successive spindle speed is constant.

- a. Addition
- b. Substraction
- c. Reciprocal
- d. None of the above

Ans: a

14. Multispeed drive with arithmetic progression is /are good in -----spindle speed range.

- a. High
- b. Low
- c. Both a and b
- d. None of the above

Ans: a

15. Multispeed drive with arithmetic progression is /are poor in -----spindle speed range.

- a. High
- b. Low
- c. Both a and b

d. None of the above

Ans: b

16. In geometric progression the -----of any two successive spindle speed is constant.

- a. Addition
- b. Subtraction
- c. Ratio
- d. None of the above

Ans: c

17. Multispeed drive with geometric progression is / are poor in-----spindle speed range.

- a. High
- b. Low
- c. Both a and b
- d. None of the above

Ans: b

18. Multispeed drive with geometric progression gives better gear box design feature.

- a. True
- b. False

Ans: a

19. In which laws of stepped regulation of speeds gives constant loss of economic cutting speed.

- a. Geometric progression
- b. Arithmetic progression
- c. Harmonic progression
- d. None of the above

Ans: a

20. In harmonic progression the -----between reciprocal of any two successive spindle speed is constant.

- a. Addition
- b. Difference
- c. Insufficient data
- d. None of the above

Ans: b

21. Multispeed drive with harmonic progression is / are poor in-----spindle speed range.

- a. High
- b. Low
- c. Both a and b
- d. None of the above

Ans: a

22. Multispeed drive with harmonic progression is / are good in-----spindle speed range.

- a. High
- b. Low
- c. Both a and b
- d. None of the above

Ans: b

23. If speed steps are obtained by arithmetic or harmonic progression the number of gear pairs required are equal to the number of speed steps.

- a. This makes gear box bulky
- b. Gear shifting time consuming as well as inconvenient
- c. Entire arrangement economically infeasible
- d. All of the above

Ans: d

24. The constant loss of economic cutting speed over the total spindle speed range, the spindle speed must be in----

- a. Geometric progression
- b. Arithmetic progression
- c. Harmonic progression
- d. None of the above

Ans: a

25. Compact and better gear box designed obtained in which law---

- a. Geometric progression
- b. Arithmetic progression
- c. Harmonic progression
- d. None of the above

Ans: a

26. The multispeed drive with ---- law is commonly used in machine tool drive.

- a. Arithmetic progression
- b. Harmonic progression
- c. Geometric progression
- d. None of the above

Ans: c

27. The range ratio for the multispeed gear box is ---

- a. The ratio of maximum output speed of gear box to the minimum output speed of the gear box.
- b. The ratio of minimum output speed of gear box to the maximum output speed of the gear box.
- c. Insufficient data
- d. None of the above

Ans: a

28. The value of range ratio R_n is large for general purpose machine tools--

- a. True
- b. False
- c. Insufficient data
- d. None of the above

Ans: a

29. The value of range ratio R_n is small for special purpose machine tools--

- a. True
- b. False
- c. Insufficient data
- d. None of the above

Ans: a

30. The smaller value of geometric progression ratio ϕ is / are used in---

- a. Large sized heavy duty machine
- b. Automats
- c. Both a and b
- d. None of the above

Ans: c

31. The larger value of geometric progression ratio ϕ is used in---

- a. Small sized special purpose machine tools
- b. Large sized heavy duty machine
- c. Automats
- d. None of the above

Ans: a

32. For the higher the value of geometric progression ratio ϕ the loss of economic cutting speed is--

- a. Low
- b. High
- c. Moderate
- d. Insufficient data

Ans: a

33. For the lower value of geometric progression ratio ϕ the loss of economic cutting speed is--

- a. Minimum
- b. Maximum
- c. Moderate
- d. Insufficient data

Ans: b

34. For the lower value of geometric progression ratio ϕ the number of speed steps or spindle speeds Z is---

- a. Large
- b. Small
- c. Insufficient data
- d. None of the above

Ans: a

35. For the higher value of geometric progression ratio ϕ the number of speed steps or spindle speeds Z is---

- a. High
- b. Low
- c. Insufficient data

d. None of the above

Ans: b

36. Standard values of geometric progression ratio ϕ for series $\phi_{20/3}$ equal to----

a. 1.41

b. 1.56

c. 1.78

d. 2

Ans: a

37. In order to compromise between the loss of economic cutting speed and the compactness of the drive the value of ϕ is selected.

a. $2 < \phi \leq 3$

b. $3 < \phi \leq 4$

c. $4 < \phi \leq 5$

d. $1 < \phi \leq 2$

Ans: d

38. Recommended value of ϕ for heavy duty machine tools and automats--

a. 1.12

b. 1.26

c. 1.14

d. 1.58

Ans: a

39. Recommended value of ϕ for medium size general purpose machine tools--

a. 1.12

b. 1.26

c. 1.14

d. 1.58

Ans: c

40. Number of spindle speed steps in machine tool gear box indicated by letter--

a. Z

b. ϕ

c. Rn

d. None of the above

Ans: a

41. The normally selected value/ s of Z is /are --

- a. 4
- b. 6
- c. 8
- d. All of the above

Ans: d

42. letter P indicates in machine tool gear box as ?

- a. Number of speed steps per stage
- b. Number of spindle speed steps
- c. Geometric ratio
- d. Range ratio

Ans: a

43. When structural formulae to be feasible , the product $P_k X_k$ must be a factor of Z--

- a. True
- b. False
- c. Insufficient data
- d. None of the above

Ans: a

44. For machine tool gear box the transmission range should not be greater than ---

- a. 9
- b. 10
- c. 11
- d. 8

Ans: d

45. In structural digram, Each zone between two adjacent vertical lines represents a---

- a. Transmission group
- b. Stage
- c. Both a and b
- d. None of the above

Ans: c

46. In speed diagram, Each horizontal line represents a---

- a. Spindle speed
- b. Spindle steps
- c. Both a and b
- d. None of the above

Ans: a

47. What is /are the limitation/s of structure diagram---

- a. It gives, The spindle speeds
- b. It gives, The motor speeds
- c. It gives ,The geometric progression ratio
- d. All of the above

Ans: d

48. Number of speed steps in any stage should not be more than---

- a. 3
- b. 4
- c. 5
- d. 6

Ans: a

49. The speed ratio in last stage should be as -----as possible.

- a. Maximum
- b. Minimum
- c. Insufficient data
- d. None of the above

Ans: a

50. Sailable feature/ s of speed diagram is / are---

- a. It gives ,The number of shaft in the gear box
- b. It gives ,The number of gears on each shaft
- c. It gives , the spindle speeds
- d. All of the above

Ans: d

51. To avoid interference on gears ,the number of teeth on the smallest gear of the gear box is---

- a. 21

- b. 16
- c. 18
- d. 20

Ans: c

52. If gear pairs on parallel shafts have same module the sum of number of teeth on mating gear must be same---

- a. Correct
- b. Incorrect
- c. Insufficient data
- d. None of the above

Ans: a

53. Minimum difference between number of teeth of adjacent gears in a change gear block must be at least---

- a. 6
- b. 3
- c. 4
- d. 5

Ans: c

54. Spacing between two adjacent gear on the shaft must be greater than -----the face width.

- a. Twice
- b. Thrice
- c. Insufficient data
- d. none of the above

Ans: a

55. If the line is inclined upwards from left to right in speed diagram represent the----

- a. Increment in speed
- b. Decrement in speed
- c. There is no speed change
- d. None of the above

Ans: a

56. If the line is inclined downwards from left to right in speed diagram represent the----

- a. Increment in speed

- b. Decrement in speed
- c. There is no speed change
- d. None of the above

Ans: b

57. If the line is straight from left to right in speed diagram represent the----

- a. Increment in speed
- b. Decrement in speed
- c. There is no speed change
- d. None of the above

Ans: c

58. Condition for optimum structure diagram---

- a. $X_1 < X_2 < X_3$
- b. $X_3 < X_2 < X_1$
- c. $X_2 < X_1 < X_3$
- d. $X_3 < X_1 < X_2$

Ans: a

59. Letter N indicate in machine tool gear box design ?

- a. Number of stages of gear box
- b. Number of spindle speed steps
- c. Range ratio
- d. geometric progression ratio

Ans: a

60. Range ratio for central lathe is --

- a. 8-10
- b. 15-25
- c. 15-30
- d. 40-60

Ans: d

61. Deviation of actual spindle speeds from calculated spindle speeds must not exceed--

- a. $10 (\phi - 1)$
- b. $20 (\phi - 1)$
- c. $30 (\phi - 1)$

d. $40(\phi-1)$

Ans: a

62. The speed diagram contains the number of horizontal lines required for locating ?

a. All spindle speeds

b. Electric motor speed

c. Both a and b

d. None of the above

Ans: c

63. Z^{th} Spindle speed in Arithmetic progression ----

a. $n_z = n_{\max} - n_{\min}/(Z-1)$

b. $n_z = (n_{\max}/n_{\min})^{1/Z-1}$

c. $n_z = 1/n_z - 1/n_1$

d. None of the above

Ans: a

64. Z^{th} Spindle speed in geometric progression ----

a. $n_z = n_{\max} - n_{\min}/(Z-1)$

b. $n_z = (n_{\max}/n_{\min})^{1/Z-1}$

c. $n_z = 1/n_z - 1/n_1$

d. None of the above

Ans: b

65. Z^{th} Spindle speed in harmonic progression ----

a. $n_z = n_{\max} - n_{\min}/(Z-1)$

b. $n_z = (n_{\max}/n_{\min})^{1/Z-1}$

c. $n_z = 1/n_z - 1/n_1$

d. None of the above

Ans: c

66. ϕ Geometric progression ratio is equal to

a. $\phi = (n_{\max}/n_{\min})^{1/Z-1}$

b. $\phi = R_n^{1/Z-1}$

c. Both a and b

d. None of the above

Ans: c

1. Histogram is

- a. A set of rectangles
- b. A line graph of class frequency plotted against class marks
- c. A bell shaped smooth curve
- d. None of the above

Ans: a

2. Frequency polygon is

- a. A set of rectangles
- b. A line graph of class frequency plotted against class marks
- c. A bell shaped smooth curve
- d. None of the above

Ans: b

3. Central tendency of population is

- a. Spread of data or extend to which the observations are scattered
- b. Mid point of distribution where most of the data cluster
- c. Concentration of data at either low or high end
- d. Distribution with sharp peak

Ans: b

4. Dispersion of population is

- a. Spread of data or extend to which the observations are scattered
- b. Mid point of distribution where most of the data cluster
- c. Concentration of data at either low or high end
- d. Distribution with sharp peak

Ans: a

5. Skewness of population is

- a. Spread of data or extend to which the observations are scattered

- b. Mid point of distribution where most of the data cluster
- c. Concentration of data at either low or high end
- d. Measure of sharp peak

Ans: c

6. Kurtosis of population is
- a. Spread of data or extend to which the observations are scattered
 - b. Mid point of distribution where most of the data cluster
 - c. Concentration of data at either low or high end
 - d. Measure of sharp peak

Ans: d

7. Central tendency of population is measured in units of
- a. Standard deviation
 - b. Arithmetic mean
 - c. Standard variable
 - d. Square of standard de

Ans: b

8. Dispersion of population is measured in units of
- a. Standard deviation
 - b. Arithmetic mean
 - c. Geometric mean
 - d. Square of standard deviation

Ans: a

9. Standard variable is
- a. Square of standard deviation
 - b. Arithmetic mean
 - c. Root mean square deviation from the mean

d. Deviation from mean in units of standard deviation

Ans: d

10. Standard deviation is

a. Square of standard variable

b. Arithmetic mean

c. Root mean square deviation from the mean

d. Deviation from mean in units of standard deviation

Ans: c

11. The area below normal curve from ($Z = -\infty$) to ($Z = +\infty$) is

a. 1

b. 0.6827

c. 0.9545

d. 0.9973

where Z is standard variable

Ans: a

12. The area below normal curve from ($Z = -1$) to ($Z = +1$) is

a. 1

b. 0.6827

c. 0.9545

d. 0.9973

where Z is standard variable

Ans: b

13. The area below normal curve from ($Z = -2$) to ($Z = +2$) is

a. 1

b. 0.6827

c. 0.9545

d. 0.9973

where Z is standard variable

Ans: c

14. The area below normal curve from ($Z = -3$) to ($Z = +3$) is

a. 1

b. 0.6827

c. 0.9545

d. 0.9973

where Z is standard variable

Ans: d

15. When two populations with means μ_X and μ_Y are added, the mean of resultant population is given by,

a. ($\mu_X + \mu_Y$)

b. ($\mu_X - \mu_Y$)

c. ($\mu_X \mu_Y$)

d. (μ_X / μ_Y)

Ans: a

16. When population Y with means μ_Y is subtracted from population X with mean μ_X , the mean of resultant population is given by,

a. ($\mu_X + \mu_Y$)

b. ($\mu_X - \mu_Y$)

c. ($\mu_X \mu_Y$)

d. (μ_X / μ_Y)

Ans: b

17. When two populations with means μ_X and μ_Y are multiplied, the mean of resultant population is given by,

a. ($\mu_X + \mu_Y$)

- b. $(\mu X - \mu Y)$
- c. $(\mu X \mu Y)$
- d. $(\mu X / \mu Y)$

Ans: c

18. When population X with mean μX , is divided by population Y with mean μY , the mean of resultant population is given by,

- a. $(\mu X + \mu Y)$
- b. $(\mu X - \mu Y)$
- c. $(\mu X \mu Y)$
- d. $(\mu X / \mu Y)$

Ans: d

19. When two populations X and Y are added, the standard deviation of resultant population is given by,

- a. $(\sigma^2 X + \sigma^2 Y)$
- b. $(\sigma^2 X + \sigma^2 Y)$
- c. $\sqrt{(\sigma^2 X + \sigma^2 Y)}$
- d. $\sqrt{(\sigma^2 X - \sigma^2 Y)}$

Ans: c

20. When population Y is subtracted from population X, the standard deviation of resultant population is given by,

- a. $(\sigma^2 X + \sigma^2 Y)$
- b. $(\sigma^2 X + \sigma^2 Y)$
- c. $(\sigma^2 X + \sigma^2 Y)$
- d. $(\sigma^2 X - \sigma^2 Y)$

Ans: c

21. The resultant population is normally distributed,

- a. When populations of two normally distributed random variables are added

- b. When populations of two normally distributed random variables are subtracted
- c. When populations of two normally distributed random variables are multiplied
- d. Any one of above

Ans: d

22. In statistically controlled system,

- a. Variations due to assignable causes are corrected
- b. Variations due to chance causes are corrected
- c. Variations due to assignable and chance causes are corrected
- d. None of these

Ans: a

23. There is no rejection of components when

- a. Design tolerance is equal to $(\pm 3 \sigma^{\wedge})$ and the process is centered
- b. Design tolerance is slightly more than $(\pm 3 \sigma^{\wedge})$
- c. Design tolerance is $(\pm 4 \sigma^{\wedge})$
- d. Any one of above

Ans: d

24. The reliability of ball bearing selected from manufacture's catalogue is

- (a) 90%
- (b) 50%
- (c) 99%
- (d) More than 90%

Ans: a

25. What is the standard deviation of clearance population for the diameter of shaft and hole assembly specified below?

Shaft diameter = 30 ± 0.15

Hole diameter = 30.5 ± 0.25

- a. 0.097 mm
- b. 0.059 mm
- c. 0.036 mm
- d. 0.390 mm

Ans: b

26. Which of the following curves have the mean value equal to zero in the graph of frequency vs random variable?

- a. Normal distribution curve
- b. Standard normal distribution curve
- c. Both a. and b.
- d. None of the above

Ans: b

27. What is the relation between standard deviation(σ) and arithmetic mean (μ) to determine coefficient of variation (C)?

- a. $C = \sigma + \mu$
- b. $C = \sigma - \mu$
- c. $C = \sigma / \mu$
- d. $C = \sigma \times \mu$

Ans: c

28. Assignable causes are caused due to changes in _____

- a. Manufacturing process
- b. Material
- c. Inspection process
- d. All of the above

Ans: d

29. If a relief valve has reliability of 0.989, how many failures are expected in testing 1000 such relief valves?

- a. 111
- b. 100

c.10

d.11

Ans: d

30. Failure rate for safety valve working for 400 hours is 3×10^{-6} failures/hour. What is the reliability of safety valve?

a.0.998

b.0.989

c.0.888

d.0.899

Ans: a

31. What is meant by hazard rate?

a.Number of failures per unit time per number of items when exposed for same time

b.Probability of test specimen fails between time t_1 and $t_1 + dt_1$ which survives for time t_1

c.Both a. and b.

d.None of the above

Ans: c

32. What causes infant mortality in mechanical equipments?

a.Design errors

b.Manufacturing defects

c.Installation defects

d.All of the above

Ans: d

33. A plain carbon steel has mean yield strength of 300 N/mm^2 and standard deviation of 50 N/mm^2 . What is the mean and standard deviation of margin of safety, if mean tensile stress of 250 N/mm^2 and standard deviation of 65 N/mm^2 acts on it?

a. 23.45 N/mm^2 , 50 N/mm^2

b. 50 N/mm^2 , 82 N/mm^2

c. 82 N/mm^2 , 7.07 N/mm^2

d. 7.07 N/mm^2 , 50 N/mm^2

Ans: b

34. What is meant by mean time to failure (MTTF)?

- a. Mean time between two successive failure components
- b. Maximum time between two successive failure components
- c. Sum of survival time for number of components divided by number of failures
- d. Sum of number of failures divided by survival time for number of components

Ans: c

35. The variation in an apparently identical component are due to---

- a. Variation in material
- b. Variation in manufacturing process
- c. Variation in workmanship
- d. All of the above

Ans: d

36. It is practically impossible to produce exactly identical component of ---

- a. Same geometrical properties
- b. Same material properties
- c. Same functional properties
- d. All of the above

Ans: d

37. Assignable cause do not occur at random but are the result of changes in the material, manufacturing process, inspection process.

- a. True
- b. False
- c. Insufficient data
- d. None of the above

Ans: a

38. In a frequency distribution , there are different measures of central value or central tendency. Choose correct option.

- a. Arithmetic mean
- b. Median
- c. Mode
- d. All of the above

Ans: d

39. The dispersion or variation or spread of a frequency distribution is measured in number of units like--

- a. Standard deviation
- b. Number of units
- c. Quartile Deviation
- d. All of the above

Ans: d

40. Coefficient of variation is defined as----

- a. Ratio of the standard deviation to the arithmetic mean
- b. Ratio of mean deviation to the arithmetic mean
- c. Ratio of quartile deviation to the arithmetic mean
- d. None of the above

Ans: a

41. In standard normal distribution curve the mean is equal to---

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

Ans: b

42. In standard normal distribution curve the standard deviation is equal to---

- a. 1
- b. 2
- c. -1
- d. 3

Ans: a

43. In standard normal distribution curve the area under curve is always equal to---

- a. 2
- b. 3
- c. 4
- d. 1

Ans: d

44. In normal distribution curve the standard deviation is any value of ---

- a. Ψ
- b. $\hat{\sigma}$
- c. μ
- d. z

Ans: b

45. In normal distribution curve the mean is only value of ---

- a. Ψ
- b. $\hat{\sigma}$
- c. μ
- d. z

Ans: c

46. In normal distribution curve the random variable is--

- a. X

b. $\hat{\sigma}$

c. μ

d. z

Ans: a

47. In normal distribution curve the standard variable is--

a. X

b. $\hat{\sigma}$

c. μ

d. z

Ans: d

48. Distribution of population under normal distribution curve population within band $\mu + 3\hat{\sigma}$ equal to

a. 99.73 %

b. 95.45 %

c. 68.27 %

d. 78.25 %

Ans: a

49. Distribution of population under normal distribution curve population within band $\mu + 2\hat{\sigma}$ equal to

a. 99.73 %

b. 95.45 %

c. 68.27 %

d. 78.25 %

Ans: b

50. The mode is / are observation/ s that occurs-----

a. Most frequently

- b. Not frequently
- c. Insufficient data
- d. None of the above

Ans: a

51. When the design tolerance is greater than the natural tolerance there is---

- a. No rejection
- b. Rejection
- c. Insufficient data
- d. None of the above

Ans: a

52. When the design tolerance is equal to the natural tolerance there is---

- a. No rejection
- b. Rejection
- c. Insufficient data
- d. None of the above

Ans: a

53. When the design tolerance is less than the natural tolerance there is---

- a. No rejection
- b. Rejection
- c. Insufficient data
- d. None of the above

Ans: b

54. Reliability it is usually denoted by R and is expressed by a number within the range---

- a. $0 \leq R \leq 1$
- b. $-1 \leq R \leq 0$
- c. $1 \leq R \leq 2$

d. $2 \leq R \leq 3$

Ans: a

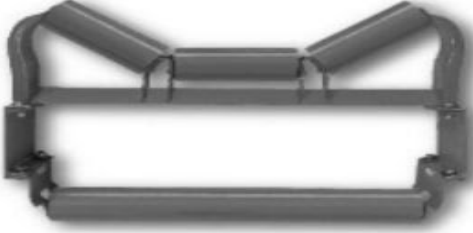
55. Reliability is defined as the probability that a component , system or device will perform without failure for a specified period of time under the specified operating conditions.

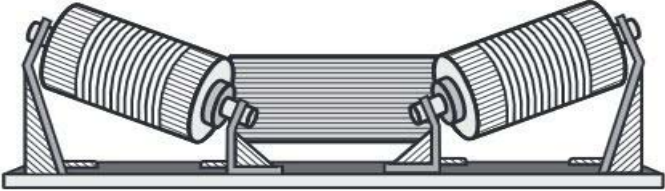
- a. Incorrect
- b. Correct
- c. Insufficient data
- d. None of the above

Ans: b

UNIT III

Question 1	The Objective of Material Handling System*	1								
Option A	Accuracy in load transportation									
Option B	Transportation of load without damage									
Option C	Low initial and operating cost									
Option D	all of above									
Answer	D									
Question 2	Economy in material handling can be achieved by_____*	1								
Option A	employing gravity feed movements									
Option B	minimizing distance of travel									
Option C	by carrying material to destination without using manual labour									
Option D	all of the above									
Answer	D									
Question 3	Unit load states that_____*	1								
Option A	materials should be moved in lots									
Option B	one unit should be moved at a time									
Option C	both ‘a’ and ‘b’									
Option D	none of the above									
Answer	A									
Question 4	Match the following and the correct order is _____*	3								
	<table><thead><tr><th>Device</th><th>Purpose</th></tr></thead><tbody><tr><td>A. Overhead crane</td><td>1. horizontal transportation</td></tr><tr><td>B. Pumps</td><td>2. lifting and lowering</td></tr><tr><td>C. chutes</td><td>3. lifting and transportation</td></tr></tbody></table>	Device	Purpose	A. Overhead crane	1. horizontal transportation	B. Pumps	2. lifting and lowering	C. chutes	3. lifting and transportation	
Device	Purpose									
A. Overhead crane	1. horizontal transportation									
B. Pumps	2. lifting and lowering									
C. chutes	3. lifting and transportation									
Option A	A-1, B-2, C-3									
Option B	A-2, B-1, C-3									
Option C	A-3, B-2, C-1									
Option D	A-2, B-3, C-1									
Answer	B									
Question 5	Which of the following statements is false for troughed belt conveyors?*	2								
	1. Troughed belt conveyors use flexible belts 2. They contain five idlers 3. Depth of trough decreases with increasing number of idlers 4. Flexibility of belt increases as depth of trough decreases									
Option A	1 and 2									
Option B	2 and 3									
Option C	3 and 4									
Option D	None of the above									
Answer	C									

Question 6	Which of the following belt conveyors have low volume carrying capacity?	1
Option A	Flat belts	
Option B	Troughed belts	
Option C	Both of above	
Option D	None of the above	
Answer	A	
Question 7	What is the mass capacity of flat belt conveyor if volumetric capacity 0.55 m ³ /hr? ($\rho = 1500 \text{ kg/m}^3$)	3
Option A	825 tons/hr	
Option B	825 kg/hr	
Option C	2.727 tons/hr	
Option D	2722 kg/hr	
Answer	B	
Question 8	An inclined belt conveyor is used for loading goods. If speed of the belt having 1500 mm width is 3 m/s then what is the volumetric capacity of the conveyor?(For 21 degree, $k = 2.35 \times 10^{-3} \text{ m}^3/\text{s}$)	3
Option A	$1.75 \times 10^{-3} \text{ m}^3/\text{s}$	
Option B	$1.5 \times 10^{-3} \text{ m}^3/\text{s}$	
Option C	$1.19 \times 10^{-3} \text{ m}^3/\text{s}$	
Option D	$2.5 \times 10^{-3} \text{ m}^3/\text{s}$	
Answer	$1.19 \times 10^{-3} \text{ m}^3/\text{s}$	
Question 9	The capacity of a conveyor belt is depends on _____	1
Option A	belt speed	
Option B	a continuous supply of products	
Option C	distance between the products being conveyed	
Option D	all of above	
Answer	D	
Question 10	Which type of conveyor is shown in figure below?	2
		
Option A	Flat belt conveyor	
Option B	Blanket belt conveyor	
Option C	Troughed belt conveyor	
Option D	Woven wire belt conveyor	
Answer	C	
Question 11	Angle of repose	1
Option A	Angle made by the surface of pile of material with horizontal	
Option B	Angle measured with respect to horizontal plane of surface of material by moving a belt	
Option C	Capacity to move by flow	
Option D	None of the above	
Answer	A	
Question 12	For very loose and free material Angle of repose is _____	1
Option A	more	

Option B	less	
Option C	same as angle of surcharge	
Option D	None of above	
Answer		
Question 13	Describe the type of idler shown in figure*	2
		
Option A	roller	
Option B	rubber covered	
Option C	Impact	
Option D	disc	
Answer	C	
Question 14	Material factor for pile is represented by ____ *	1
Option A	K1	
Option B	K2	
Option C	K3	
Option D	K4	
Answer	A	
Question 15	Where do adjust the tension on a conveyor belt?*	1
Option A	at ending point of conveyor	
Option B	at starting point of conveyor	
Option C	at roller	
Option D	at the take-up pulley	
Answer	A	
Question 16	Impact idlers are used in a belt conveyor at*	1
Option A	the return point	
Option B	the loading points	
Option C	an interval of 15m on a conveyor run	
Option D	none of these	
Answer	B	
Question 17	Volumetric capacity of inclined belt conveyor is ____ *	2
Option A	$Q = C \cdot b^2 \cdot V$	
Option B	$Q = k \cdot b^2 \cdot V$	
Option C	$Q = C \cdot V \cdot b^2$	
Option D	$Q = k \cdot V \cdot b^2$	
Answer	C	
Question 18	Which material is classified as bulk material*	1
Option A	coal	
Option B	iron ore	
Answer	A	
Question 19	Belt conveyors are operated in ____ *	1
Option A	vertical plane	
Option B	horizontal plane	

Option C	inclined plane	
Option D	smooth surface on all of these planes	
Answer	D	
Question 20	Resisting force on conveyor belt shown in below figure is at _____*	1
	$F_{cr} = f_c \left(m_m + m_b + \frac{m_{ci} Z_c}{l} \right) gl$	
Option A	Lifting of material	
Option B	Idlers	
Option C	Loading station	
Option D	Unloading station	
Answer	B	
Question 20	Material handling consists of movement of material from	1
Option A	one machine to another	
Option B	one shop to another shop	
Option C	stores to shop	
Option D	all of the above	
Answer	D	
		1
Question 21	The following is used to transport materials having flat bottoms	
Option A	Belt conveyor	
Option B	Roller conveyor	
Option C	Chain conveyor	
Option D	None of the above	
Answer	B	
Question 22	Fork lift truck is used for	1
Option A	lifting and lowering	
Option B	vertical transportation	
Option C	both 'a' and 'b'	
Option D	none of the above	
Answer	C	
Question 23	Cranes are used for	1
Option A	lifting and lowering	
Option B	vertical transportation	
Option C	both 'a' and 'b'	
Option D	none of the above	
Answer	C	
Question 24	Which of the following is a property of bulk load?	1
Option A	Hardness	

Option B	Cake forming tendency	
Option C	Suspension part	
Option D	Weight	
Answer	B	
Question 25	What are bulk loads?	1
Option A	Lump of material	
Option B	Single rigid mass	
Option C	Homogeneous particles	
Option D	Heterogeneous particles	
Answer	B	
Question 26	Which belt conveyor prevents sliding down of material at an inclination of 55° with horizontal?	1
Option A	Flat belt conveyor	
Option B	Troughed belt conveyor	
Option C	Blanket belt conveyor	
Option D	Woven wire belt conveyors	
Answer	C	
Question 27	Mass capacity of a conveyor is 200 ton/hr, if speed of the belt is 4 m/s then what is the width of horizontal flat belt conveyor carrying the load? (Surcharge factor = 0.075 & $\rho = 1000 \text{ kg/m}^3$)	3
Option A	499.23 mm	
Option B	500.0 mm	
Option C	533.7 mm	
Option D	Insufficient data	
Answer	533.7 mm	
Question 28	The angle of repose depends on	1
Option A	shape of the material	
Option B	smoothness of the material	
Option C	degree of fineness of the material	
Option D	all of the above	
Answer	degree of fineness of the material	
Question 29	Which of the following application is a belt conveyor used for?	
		1
Option A	Material transportation over long distances	
Option B	Material transportation within premises	
Option C	Material transportation for processing	
Option D	All of the mentioned	
Answer	D	
Question 30	Statement 1: It is generally not possible to change the direction of flow with belt conveyors.	2

	Statement 2: If belt conveyors are to be used in the bent position, slat belts are used.	
Option A	True, False	
Option B	True, True	
Option C	False, False	
Option D	False, True	
Answer	B	

UNIT IV

Sr No.	Questions	Marks
Question 1	A cylinder is considered as thin cylinder when the ratio of inner diameter to the wall thickness is	1
Option A	more than 15	
Option B	less than 15	
Option C	equal to 15	
Option D	none of these criteria	
Answer	A	
Question 2	A cylinder is considered as thick cylinder when the ratio of inner diameter to the wall thickness is	1
Option A	more than 15	
Option B	less than 15	
Option C	equal to 15	
Option D	none of these criteria	
Answer	B	
Question 3	In thin cylinders, the longitudinal stress is,	1
Option A	2(circumferential stress)	
Option B	1/2(circumferential stress)	
Option C	1/4(circumferential stress)	
Option D	4(circumferential stress)	
Answer	B	
Question 4	The thickness of thin cylinder is determined on the basis of	1
Option A	radial stress	
Option B	longitudinal stress	
Option C	circumferential stress	
Option D	principal shear stress	
Answer	circumferential stress	
	C	
Question 5	The thickness of thin cylindrical shell is given by,	2
Option A	$\pi Di/2\sigma t$	
Option B	$\pi Di/4\sigma t$	
Option C	$2\pi Di/\sigma t$	
Option D	$4\pi Di/\sigma t$	
Answer	A	
Question 6	The thickness of thin spherical shell is given by,	2
Option A	$\pi Di/2\sigma t$	
Option B	$\pi Di/4\sigma t$	
Option C	$2\pi Di/\sigma t$	
Option D	$4\pi Di/\sigma t$	
Answer	B	
Question 7	In thick cylinders, the tangential stress across the thickness of cylinder	1
Option A	remains uniform throughout	
Option B	varies from internal pressure at the inner surface to zero at the outer surface	
Option C	varies from maximum value at the inner surface to minimum value at the outer surface	
Option D	varies from maximum value at the outer surface to minimum value at the inner surface	
Answer	C	
Question 8	In thick cylinders, the radial stress across the thickness of cylinder	1
Option A	remains uniform throughout	
Option B	varies from internal pressure at the inner surface to zero at the outer surface	
Option C	varies from maximum value at the inner surface to minimum value at the outer surface	
Option D	varies from maximum value at the outer surface to minimum value at the inner surface	
Answer	B	

Question 9	In thick cylinders, the axial stress across the thickness of cylinder	1
Option A	remains uniform throughout	
Option B	varies from internal pressure at the inner surface to zero at the outer surface	
Option C	varies from maximum value at the inner surface to minimum value at the outer surface	
Option D	varies from maximum value at the outer surface to minimum value at the inner surface	
Answer	A	
Question 10	In thin cylinders, the tangential stress across the thickness of cylinder	1
Option A	remains uniform throughout	
Option B	varies from internal pressure at the inner surface to zero at the outer surface	
Option C	varies from maximum value at the inner surface to minimum value at the outer surface	
Option D	varies from maximum value at the outer surface to minimum value at the inner surface	
Answer	A	
Question 11	The thickness of thick cylindrical shell with closed ends and made of brittle material is determined by,	1
Option A	Lame's equation	
Option B	Clavarino's equation	
Option C	Birnie's equation	
Option D	Barlow's equation	
Answer	A	
Question 12	The thickness of thick cylindrical shell with closed ends and made of ductile material is determined by,	1
Option A	Lame's equation	
Option B	Clavarino's equation	
Option C	Birnie's equation	
Option D	Barlow's equation	
Answer	B	
Question 13	The thickness of thick cylindrical shell with open ends and made of ductile material is determined by,	1
Option A	Lame's equation	
Option B	Clavarino's equation	
Option C	Birnie's equation	
Option D	Barlow's equation	
Answer	C	
Question 14	The thickness of high-pressure oil and gas pipes is determined by,	1
Option A	Lame's equation	
Option B	Clavarino's equation	
Option C	Birnie's equation	
Option D	Barlow's equation	
Answer	D	
Question 15	Autofrettage is,	2
Option A	a surface coating process of cylinders for corrosion resistance	
Option B	a heat treatment process for cylinders to relieve residual stresses	
Option C	a process of prestressing the cylinder to develop residual compressive stress at inner surface	
Option D	a surface hardening process of cylinder to improve wear resistance	
Answer	C	
Question 16	Autofrettage is achieved by,	2
Option A	compound cylinder	
Option B	overloading the cylinder before putting it in service	
Option C	winding a wire under tension around the cylinder	
Option D	any one of the above methods	

Answer	D	
Question 17	A gasket is made of,	2
Option A	asbestos or cork	
Option B	lead, copper or aluminum	
Option C	vulcanized rubber	
Option D	any one of the above	
Answer	D	
Question 18	Welded pressure vessels made of steel plates should be designed according to 'Code for unfired vessel IS-2825' when,	2
Option A	internal pressure is from 1 kgf/cm ² to 200 kgf/cm ²	
Option B	internal diameter is less than 150 mm	
Option C	water container is to be designed with capacities less than 500 litres	
Option D	steam boilers and nuclear pressure vessels are to be designed	
Answer	A	
Question 19	Class 1 pressure vessels are to be designed according to 'Code for unfired vessel IS-2825' when	2
Option A	hydrocyanic acid, carbonyl chloride or mustard gas are stored	
Option B	operating temperature is more than -20 ⁰ C	
Option C	liquefied petroleum gas is stored	
Option D	thickness of shell is less than 38 mm	
Answer	A	
Question 20	Class 3 pressure vessels are to be designed according to 'Code for unfired vessel IS-2825' when,	2
Option A	operating pressure is less than 17.5 kgf/cm ²	
Option B	operating temperature is more than 0 ⁰ C and less than 250 ⁰ C	
Option C	thickness of shell is less than 16 mm	
Option D	any one of the above	
Answer	D	
Question 21	While designing pressure vessels according to 'Code for unfired vessel IS- 2825', the design pressure is taken as	2
Option A	1.05(maximum operating pressure)	
Option B	1.5(maximum operating pressure)	
Option C	2(maximum operating pressure)	
Option D	1.3(maximum operating pressure)	
Answer	A	
Question 22	Weld joint efficiency is maximum when the pressure vessel is welded by	1
Option A	single-welded butt joint with backing strip	
Option B	single-welded butt joint without backing strip	
Option C	double-welded butt joint with full penetration	
Option D	none of the above	
Answer	C	
Question 23	Type of domed heads for the pressure vessel is	1
Option A	hemispherical head	
Option B	semi-ellipsoidal head	
Option C	torispherical head	
Option D	any one of the above	
Answer	D	
Question 24	The end-closure for tankers of milk, petrol or diesel is	

Option A	hemispherical head	1
Option B	semi-ellipsoidal head	
Option C	torispherical head	
Option D	Flat head	
Answer	C	
Question 25	The end-closure for tall vertical pressure vessel is	1
Option A	hemispherical head	
Option B	semi-ellipsoidal head	
Option C	torispherical head	
Option D	Flat head	
Answer	A	
Question 26	cylinder made of plain carbon steel has inner diameter 100 mm. What is the thickness of cylinder if maximum internal pressure of 20 Mpa acts on it? ($\sigma_{all} = 100 \text{ N/mm}^2$ & poisson's ratio = 0.3)	3
Option A	11 mm	
Option B	15.36 mm	
Option C	22.32 mm	
Option D	80 mm	
Answer	A	
Question 27	Clavero's equation is applicable to cylinders with _____	1
Option A	close ends	
Option B	open ends	
Option C	both a. and b.	
Option D	none of the above	
Answer	A	
Question 28	Why is autofrettage process used in pressure vessels?	1
Option A	Increase fatigue lifetime	
Option B	To enhance carrying capacity	
Option C	To introduce compressive residual stress in them	
Option D	All of the above	
Answer	D	
Question 29	A seamless cylinder of storage capacity of 0.03m ³ is subjected to an internal pressure of 21MPa. The ultimate strength of material of cylinder is 350N/mm ² . Determine the length of the cylinder if it is twice the diameter of the cylinder.	3
Option A	540mm	
Option B	270mm	
Option C	400mm	
Option D	350mm	
Answer	A	
Question 30	Internal pressure of 2.5 Mpa acts on a pressure vessel of thickness 15 mm and internal diameter of 1500 mm. What is the stress induced in longitudinal direction?	3
Option A	36.63 N/mm ²	
Option B	59.13 N/mm ²	
Option C	65.62 N/mm ²	
Option D	131.25 N/mm ²	
Answer	65.62 N/mm ²	
Question 31	Which of the following is not an unfired pressure vessel?	1
Option A	Heat exchanger	
Option B	Storage vessels	
Option C	Steam boilers	
Option D	None of the above	
Answer	C	

UNIT V

Question 1	I.C. engine cylinder is made of,	1
Option A	cast iron	
Option B	plain carbon steel	
Option C	alloy steel	
Option D	copper	
Answer	A	
		1
Question 2	The ratio of length of stroke to cylinder bore (l/D) is usually,	
Option A	a. 1/2	
Option B	b. 5	
Option C	c. 1.5	
Option D	d. 1/4	
Answer	C	
Question 3	Cylinder thickness is calculated on the basis of,	1
Option A	radial stress	
Option B	residual stress	
Option C	whipping stress	
Option D	circumferential hoop stress	
Answer	D	
Question 4	The length of cylinder is taken as,	1
Option A	equal to cylinder diameter	
Option B	equal to length of stroke	
Option C	1.15 times of stroke length	
Option D	1.5 times length of piston	
Answer	C	
Question 5	Piston is made of	
Option A	alloy steel	1
Option B	plain carbon steel	
Option C	cast iron	
Option D	brass	
Answer	C	
Question 6	The function of piston skirt is	1
Option A	to provide bearing surface for side thrust	
Option B	to support gas load	
Option C	to support gudgeon pin	
Option D	to seal the cylinder and prevent leakage of oil past piston	
Answer	A	
Question 7	The ratio of side thrust on piston to maximum gas force on piston head is,	1
Option A	1	
Option B	0.5	
Option C	0.25	
Option D	0.1	
Answer	D	
Question 8	For buckling consideration, the end conditions of connecting rod in plane of motion are,	1
Option A	one end is free and the other fixed	
Option B	both ends are hinged	
Option C	both ends are fixed	

Option D	one end is fixed and the other hinged	
Answer	B	
Question 9	The condition for connecting rod to be equally strong in plane of motion (XX) and a plane perpendicular to plane of motion (YY) is,	2
Option A	$I_{xx} = I_{yy}$	
Option B	$I_{xx} = 4 I_{yy}$	
Option C	$4 I_{xx} = I_{yy}$	
Option D	$I_{xx} = 2 I_{yy}$	
Answer	B	
Question 10	Connecting rod is made of,	1
Option A	aluminium	
Option B	medium carbon steel	
Option C	cast iron	
Option D	babbits	
Answer	B	
Question 11	The ratio of length of connecting rod to the crank radius (L/r) is usually,	2
Option A	1.5 to 2	
Option B	10 to 12	
Option C	4 to 5	
Option D	1:1	
Answer	C	
Question 12	The bolts for the cap of big end of connecting rod are subjected to	1
Option A	only gas force	
Option B	only inertia force	
Option C	only side thrust	
Option D	inertia force, gas force and side thrust	
Answer	B	
Question 13	Automotive crankshafts are made by,	1
Option A	casting process	
Option B	machining from rolled stock	
Option C	drop forging process	
Option D	welding process	
Answer	C	
Question 14	The function of valve gear mechanism is,	1
Option A	to rotate the cam	
Option B	to reduce the speed of crankshaft	
Option C	to transmit the power	
Option D	open and close inlet and exhaust valve	
Answer	D	
Question 15	At the top dead centre position, the crankshaft is subjected to,	1
Option A	maximum torque	
Option B	maximum bending moment	
Option C	maximum torsional and bending moment	
Option D	none of the above	
Answer	B	
Question 16	At the top dead centre position, the crankshaft is subjected to,	1

Option A	maximum torque	
Option B	maximum bending moment	
Option C	maximum torsional and bending moment	
Option D	none of the above	
Answer	B	
Question 17	For maximum torque condition, the crank angle is,	2
Option A	0° from top dead centre for petrol and diesel engines	
Option B	33° before top dead centre for petrol engine and 1° after top dead centre position for diesel engine	
Option C	25° to 35° for petrol engine and 30° to 40° for diesel engine from top dead centre	
Option D	90° from top dead centre for petrol and diesel engines	
Answer	C	
Question 18	The area of inlet valve is	1
Option A	equal to the area of exhaust valve	
Option B	more than the area of exhaust valve	
Option C	less than the area of exhaust valve	
Option D	none of the above	
Answer	B	
Question 19	Whipping stress is due to	1
Option A	vibrations of crankshaft	
Option B	reciprocating motion of piston	
Option C	inertia force on connecting rod	
Option D	obliquity of connecting rod	
Answer	C	
Question 20	When the length of connecting rod is small, it results in	1
Option A	greater angular swing and greater side thrust on piston	
Option B	lesser angular swing and lesser side thrust on piston	
Option C	more chances of buckling failure	
Option D	no side thrust on piston	
Answer	A	
Question 21	The design of piston head is based on	1
Option A	strength and rigidity considerations	
Option B	bending and torsional moments	
Option C	buckling consideration	
Option D	strength and heat transfer considerations	
Answer	D	
Question 22	The spring index for valve spring is usually	1
Option A	5	
Option B	8	
Option C	12	
Option D	20	
Answer	B	
Question 23	The main objective of providing two concentric valve springs, one inside another, in heavy duty engines is,	1
Option A	to increase force on valve	
Option B	to eliminate surge	
Option C	to provide fail safe system	
Option D	to provide linear force-deflection characteristic	

Answer	B	
Question 24	Push rod is designed on the basis of,	1
Option A	tensile strength	
Option B	compression strength	
Option C	bending strength	
Option D	buckling strength	
Answer	D	
Question 25	The valve lift depends upon	1
Option A	bore and length of cylinder	
Option B	length of connecting rod and crank radius	
Option C	seat angle and diameter of port	
Option D	length of stroke and length of piston	
Answer	C	
Question 26	Valve springs have	1
Option A	plain ends	
Option B	plain and ground ends	
Option C	square ends	
Option D	square and ground ends	
Answer	D	

SR.NO.	UNIT NO.VI OPTIMUM DESIGN	MARKS
Question 1	Which of the following is no expressed by primary design equation ?	1
Option A	Functional parameters	
Option B	Material parameters	
Option C	Geometrical parameters d	
Option D	none of the above	
Answer	D	
		1
Question 2	The limit equatipn $St = S_{ut} / N_f$ is expressed as ----	
Option A	loose limit equation	
Option B	rigid limit equation	
Option C	rigid on one side and loose on other side	
Option D	none of the above	
Answer	D	
Question 3	Which is / are the design parameter/ s in a design of any mechanical element ?	1
Option A	Functional requirement parameter	
Option B	Material parameter	
Option C	Geometrical parameter	
Option D	All of the above	
Answer	D	
Question 4	Functional requirement parameter are-----	1
Option A	Positive	
Option B	Negative	
Option C	Both (a) and (b)	
Option D	Neither (a) and (b)	
Answer	C	
Question 5	Functional requirement parameter are indpend on -----	1
Option A	Material Parameter	
Option B	Geometrical parameter	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	C	
Question 6	Individual functional requirement parameter on each other.	1
Option A	Independent	
Option B	Dependent	
Option C	Independent or Dependent	
Option D	None of the above	
Answer	B	
Question 7	Choose incorrect example of functional requirement parameters ?	1
Option A	Power tansmitting capacity and gera ratio of gear pair	
Option B	Maximum force exerted by the spring stiffness for helical compression spring	
Option C	Cost	
Option D	Density	

Answer	D	
Question 8	Choose desirable functional requirement parameter ?	1
Option A	Weight	
Option B	Stress	
Option C	Deflection	
Option D	Power transmitting capacity and gear ratio for gear pair	
Answer	D	
Question 9	The undesirable effect / s ---	1
Option A	Negative functional requirement	
Option B	Positive functional requirement	
Option C	both (a) and (b)	
Option D	None of the above	
Answer	A	
Question 10	Choose incorrect material parameter ?	1
Option A	Cost per unit weight	
Option B	Density	
Option C	Yield strength	
Option D	Vibration	
Answer	D	
Question 11	The material parameter are independent on ----	1
Option A	Functional requirement parameter	
Option B	Geometrical Parameter	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	C	
Question 12	The material parameter are generally not _____ of each other.	1
Option A	Dependent	
Option B	Independent	
Option C	Both (a) and (b)	
Option D	none of the above	
Answer	B	
Question 13	The geometrical parameters are dependent on the ----	
Option A	material parameters	1
Option B	Functional requirement parameters	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	C	
Question 14	The geometrical parameter for a spur gear are--Choose incorrect geometrical parameter	1
Option A	Pressure ratio	
Option B	Addendum	
Option C	Pressure angle	
Option D	Face width	
Answer	A	

Question 15	Classification of Design Parameter/ s based on status in design problem.	1
Option A	limited Parameters	
Option B	Specific Parameters	
Option C	Unspecified and Unlimited parameters	
Option D	All of the above	
Answer	A	
Question 16	Specified Parameter as given below. Choose correct.	2
Option A	$P = 30 \text{ kw}$	
Option B	$30\text{mm} \leq d \leq 60 \text{ mm}$	
Option C	$60 \text{ mm} \leq l \leq 90 \text{ mm}$	
Option D	none of the above	
Answer	A	
Question 17	In adequate design available for single design problem	1
Option A	There are number of adequate design	
Option B	Unique adequate design	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	A	
Question 18	The optimum design targets a single paramete for optimizing while fulfilling the other requirement.	1
Option A	a. Maximizing	
Option B	b. Minimizing	
Option C	c. Both (a) and (b)	
Option D	d. None of the above	
Answer	C	
Question 19	The objective in the optimum design might be to maximize one of the quanyity, consider the following parameters. Choose correct.	1
Option A	Cost	
Option B	Deflection	
Option C	Center distance	
Option D	Load carrying capacity	
Answer	D	
Question 20	The objective in the optimum design might be to minimize one of the quanyity, consider the following parameters. Choose correct.	1
Option A	Power transmitting Capacity	
Option B	Energy storing Capacity	
Option C	Load carrying capacity	
Option D	Deflection	
Answer	D	
Question 21	How many design avialable in adeduate design.	1
Option A	Number of design available	
Option B	Unique design available	
Option C	Both (a) and (b)	
Answer	A	

Question 22	How many design available in optimum design.	1
Option A	Unique design available	
Option B	Number of design available	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	B	
Question 23	In design procedure, How many type/s of design equation use ?	
Option A	Primary design equation (P.D.E)	1
Option B	Limit equation (L.E)	
Option C	Subsidiary Design equation (S.D.E)	
Option D	All of the above	
Answer	D	
Question 24	The subsidiary design equations express----	
Option A	Material Parameters	1
Option B	Geometrical Parameters	
Option C	Either Functional requirement or Undesirable effects	
Option D	All of the above	
Answer	C	
Question 25	The primary design equation is the most important design equation Which Express----	1
Option A	The most significant functional requirement to be maximized	
Option B	The most significant undesirable effect to be minimized	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	C	
Question 26	Which is the most significant undesirable effect to be minimized . Choose Incorrect Parameter.	1
Option A	Cost	
Option B	Weigth.	
Option C	Vibration	
Option D	Module	
Answer	D	
Question 27	Stess equations in any optimum design are generally-----	
Option A	Limit equation (L.E)	1
Option B	Subsidiary design equation (S.D.E)	
Option C	Primary design equation	
Option D	All of the above	
Answer	B	
Question 28	If it is paooble to combine the effect of all subsidairy design eauaion, limit equation and specified parameters in primary design equation (P.D.E) then it is the case of-----	1
Option A	Normal specifications	
Option B	Redudant Specifications	
Option C	Incompatible Specifications	
Option D	None of the above	
Answer	B	

Question 29	If it is possible to combine the effect of all subsidiary design equation, limit equation and specified parameters in primary design equation (P.D.E) then it is the case of-----	1
Option A	Normal specifications	
Option B	Redundant Specifications	
Option C	Incompatible Specifications	
Option D	None of the above	
Answer	B	
Question 30	$\sigma_t = F / A$ it is called as-----	
Option A	Limit equation	
Option B	Primary design Equation	
Option C	Subsidiary design equation	
Option D	None of the above	
Answer	C	
Question 31	$\sigma_t \leq \sigma_{yt} / N_f$ it is called as ----	
Option A	Limit equation	
Option B	Primary design Equation	
Option C	Subsidiary design equation	
Option D	None of the above	
Answer	C	
Question 32	Choose correct material parameters.	2
Option A	w , ρ	
Option B	A , L	
Option C	F , N_f	
Option D	σ_t , σ_{yt}	
Answer	D	
Question 33	Choose correct functional parameters.	2
Option A	w , ρ	
Option B	A , L	
Option C	F , N_f	
Option D	σ_t , σ_{yt}	
Answer	C	
Question 34	Choose correct geometrical parameters as limited value , unspecified and unlimited value ?	2
Option A	w , ρ	
Option B	L, A	
Option C	F , N_f	
Option D	σ_t , σ_{yt}	
Answer	B	
Question 35	Choose undesirable effect parameters as limited value, unspecified and unlimited value.	2
Option A	σ , w	
Option B	L , A	
Option C	ρ , σ_{yt}	
Option D	F , N_f	
Answer	A	

Question 36	Choose material selection factor/s---	2
Option A	σ/S_{ut}	
Option B	σ/S_{yt}	
Option C	Both (a) and (b)	
Option D	None of the above	
Answer	C	