1.	**Laplace transform of** $f(t) = \begin{cases} \frac{t}{k} & ,t < k \\ 0 & ,t > k \end{cases}$ **is** **(A)** $-\frac{e^{-ks}}{s^2}\left[s + \frac{1}{k}\right]$ **(B)** $\frac{ke^{-ks}}{s^2}[ks + 1]$ **(C)** $\frac{e^{-ks}}{ks^2}\left[-s - \frac{1}{k}\right]$ **(D)** $\frac{e^{-ks}}{s^2}\left[s + \frac{1}{k}\right]$	A
2.	$\mathscr{L}\left[2^t\right] =$ **(A)** $\frac{1}{\log(2)}$ **(B)** $\frac{1}{s-\log(2)}$ **(C)** $\frac{\log(2)}{s-2}$ **(D)** $\log(s-2)$	B
3.	**Laplace transform of f(t) is given by .** **(A)** $f(s) = \int_0^\infty e^{-st} f(t)\,\mathrm{d}\,t$ **(B)** $f(t) = \int_0^\infty e^{-st} f(t)\,\mathrm{d}\,t$ **(C)** $F(s) = \int_0^\infty e^{-st} F(t)\,\mathrm{d}\,t$ **(D)** $F(s) = \int_0^\infty e^{-st} f(t)\,\mathrm{d}\,t$	D

4.	$\mathscr{L}\left[t^{4/3}\right] =$ **(A)** $\frac{(1/3)!}{s^{7/3}}$ **(B)** $\frac{\Gamma(4/3)}{s^{7/3}}$ **(C)** $\frac{4\Gamma(1/3)}{9s^{7/3}}$ **(D)** $\frac{\Gamma(4/3)}{3s^{7/3}}$	C
5.	$\mathscr{L}\left[100^t + 2t^{10}\right] =$ **(A)** $\frac{1}{s-100} + \frac{2 \cdot 10!}{s^{11}}$ **(B)** $\frac{1}{s+100} + \frac{20!}{s^{11}}$ **(C)** $\frac{1}{s-\log_e(100)} + \frac{20!}{s^{11}}$ **(D)** $\frac{1}{s-2\log_e(10)} + \frac{2 \cdot 10!}{s^{11}}$	D
6.	**If** $f\left(t\right) = (3t+2)^2$ **then** $\mathscr{L}[f(t)] =$ **(A)** $\frac{3}{s^2} + \frac{2}{s}$ **(B)** $\frac{9}{s^3} + \frac{6}{s^2} + \frac{2}{s}$ **(C)** $\frac{18}{s^3} + \frac{12}{s^2} + \frac{4}{s}$ **(D)** $\frac{18}{s^3} + \frac{18}{s^2} + \frac{4}{s}$	C

7.	$\mathscr{L}^{-1}\left[\frac{1}{s-\log\ a}\right] =$ **(A)** e^{at} **(B)** $e^{\log\ a}$ **(C)** a^t **(D)** t^a	C
8.	**Laplace transform of** $f(t) = \sin^2 2t\ \cos t$ **is** **(A)** $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{s}{s^2+9}\right]$ **(B)** $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{9}{s^2+9}\right]$ **(C)** $\frac{1}{4}\left[\frac{s}{s^2+1} + \frac{9}{s^2+9}\right]$ **(D)** $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{3}{s^2+9}\right]$	A
9.	**If** $\mathscr{L}[f(t)] = F(s)$**, then** $\mathscr{L}[t^n f(t)] =$ **(A)** $(-1)\frac{\mathrm{d}}{\mathrm{d}s}\{F(s)\}$ **(B)** $(-1)^n\frac{\mathrm{d}}{\mathrm{d}s}\{F(s)\}$ **(C)** $(-1)\frac{\mathrm{d}^n}{\mathrm{d}s^n}\{F(s)\}$ **(D)** $(-1)^n\frac{\mathrm{d}^n}{\mathrm{d}s^n}\{F(s)\}$	D

10.	$\mathscr{L}\left[e^{-t}\left(\sin 2t + t^2\right)\right] =$ **(A)** $\frac{2}{(s+1)^2+4} + \frac{2}{(s+1)^3}$ **(B)** $\frac{2}{s^2+4} + \frac{2!}{s^3}$ **(C)** $\frac{4}{(s+1)^2+4} + \frac{2}{(s+1)^3}$ **(D)** $\frac{2}{(s^2+1)^2+4} + \frac{2!}{(s^2+1)^3}$	A
11.	**Laplace transform of $f(t) = t\sin 3t$ is** **(A)** $\frac{3}{s^2+9}$ **(B)** $\frac{3s}{(s^2+3)^2}$ **(C)** $\frac{6s}{(s^2+3)^2}$ **(D)** $\frac{6s}{(s^2+9)^2}$	D
12.	**Laplace transform of $H(t-a)$ is** **(A)** $\frac{e^{-as}}{s^2}$ **(B)** $\frac{e^{-as}}{t-a}$ **(C)** $\frac{e^{-as}}{s-a}$ **(D)** $\frac{e^{-as}}{s}$	C

13.	$Laplace\ transformation\ of\ \delta(t-a)\ is$ **(A)** $e^{\delta s}$ **(B)** e^{as} **(C)** e^{-as} **(D)** $e^{\delta t}$	C
14.	$L^{-1}\left[\frac{1}{(s+1)^2}\right]\ is$ **(A)** te^{t} **(B)** $-te^{t}$ **(C)** t^2e^{-t} **(D)** te^{-t}	D
15.	$L^{-1}\left[\frac{1}{s^n}\right]\ is\ possible\ when\ n\ is$ **(A)** $zero$ **(B)** $Negative\ integer$ **(C)** $Positive\ integer$ **(D)** $Negative\ rational$	c

16.	$\mathscr{L}\left[e^{-3t}t^{3}/_{2}\right] =$ **(A)** $\frac{2\sqrt{\pi}}{4(s+3)^{5}/_{2}}$ **(B)** $\frac{3\sqrt{\pi}}{4(s+3)^{5}/_{2}}$ **(C)** $\frac{3!\,\sqrt{\pi}}{4(s+3)^{5}/_{2}}$ **(D)** $\frac{2!\,\sqrt{\pi}}{4(s+3)^{5}/_{2}}$	b
17.	$If\ F\left(s\right) = \frac{3s+4}{(s^2+9)}\ then\ f\left(t\right)\ is$ **(A)** $3\sin\ 3t + 2\cos\ 3t$ **(B)** $3\cos\ 3t + \frac{4}{3}\sin\ 3t$ **(C)** $3\cos\ 3t + \frac{1}{3}\sin\ 3t$ **(D)** $3\sin\ 3t + \frac{4}{3}\cos\ 3t$	b

18.	**If $f(t) = e^t \sin 4t$ then $\mathscr{L}[tf(t)]$ is** **(A)** $\frac{8s-8}{(s^2-2s+17)^2}$ **(B)** $\frac{8s-1}{(s^2-2s+17)^2}$ **(C)** $\frac{4s-1}{(s^2-2s+17)^2}$ **(D)** $\frac{4s-4}{(s^2-2s+17)^2}$	A
19.	**If $f(t) = 1 - e^t$ then $\mathscr{L}\left[\frac{f(t)}{t}\right]$ is** **(A)** $\frac{1}{s} - \frac{1}{s+1}$ **(B)** $\frac{1}{s} + \frac{1}{s-1}$ **(C)** $\log\left(\frac{s+1}{s}\right)$ **(D)** $\log\left(\frac{s-1}{s}\right)$	C
20.	**If $f(t) = \sin t$ then $\mathscr{L}\left[\frac{e^t f(t)}{t}\right]$ is** **(A)** $\cot^{-1}(s-1)$ **(B)** $\tan^{-1}(s+1)$ **(C)** $\tan^{-1}(s-1)$ **(D)** $\cot^{-1}(s+1)$	a

21.	If $f(t) = \frac{\sin t}{e^{5t}}$ then $\mathscr{L}\left[f'(t)\right]$ is (A) $\frac{1}{s^2+5s+25}$ (B) $\frac{s}{s^2+10s+26}$ (C) $\frac{s}{s^2+5s+25}$ (D) $\frac{1}{s^2+10s+26}$	B
22.	$\mathscr{L}^{-1}\left[\frac{1}{s}\right] =$ (A) $\left[\frac{1}{s}\right] = t$ (B) t^2 (C) $u(t)$ (D) $\delta(t)$	c
23.	If $f(t) = t\cos t$ the $\mathscr{L}\left[\int_0^t f(t)\ \mathrm{d}\ t\right] =$ (A) $\frac{s^2-1}{s(s^2+2s+2)}$ (B) $\frac{s-1}{(s^3+2s^2+2s)}$ (C) $\frac{s^2-1}{s(s^2+2s+1)}$ (D) $\frac{s-1}{(s^3-2s^2+2s)}$	C

24.	**Two random samples having the following data:** | Sample No.	Size | |---|---| | I | # 4 # | | II | # 15 # | **Test whether the samples come from the same normal population. #** [F for 3 and 4 df is 3.34] **#** **(A)** Accept the null hypothesis and both the samples come from the different normal population. **(B)** Reject the null hypothesis and both the samples come from the same normal population. **(C)** Accept the null hypothesis and both the samples come from the same normal distribution. **(D)** None of these.	c
25.	**The standard deviation is always _____ than the mean deviation.** **(A)** Greater **(B)** Less **(C)** Equar **(D)** None of these	A

26.	**The correlation coefficient between income and expenditure is _____ .** **(A)** Positive **(B)** Negative **(C)** Zero **(D)** None of these	A
27.	**The equation of regression line y on x is _____ .** **(A)** $(y - \bar{y}) = b_{xy}(x - \bar{x})$ **(B)** $(x - \bar{x}) = b_{xy}(y - \bar{y})$ **(C)** $(y - \bar{y}) = b_{yx}(x - \bar{x})$ **(D)** $(x - \bar{x}) = b_{yx}(y - \bar{y})$	C
28.	**If two regression coefficients are -0.9 and -0.1, the value of correlation coefficient is _____ .** **(A)** 0.3 **(B)** 0.5 **(C)** -0.3 **(D)** -0.5	A

29.	**The correlation coefficient** $r = \pm 1.5$ **is _____ .** **(A)** Possible **(B)** Sometimes possible **(C)** Not possible **(D)** None of these	C
30.	**A measure of linear relationship between two variables is** **(A)** Correlation coefficient **(B)** Regression coefficient **(C)** Both **(D)** None of these	A
31.	**If two ariables x and y are independent of each other then they have _** **(A)** Perfect positive correlation **(B)** Perfect negative correlation **(C)** No correlation **(D)** None of these	c

32.	**The equations of regression line are** $$y = 0.5x + a$$ **and** $$x = 0.4y + b$$ **then the correlation coefficient is _____ .** **(A)** $\sqrt{0.2}$ **(B)** $-\sqrt{0.2}$ **(C)** 0.45 **(D)** 0.63	A
33.	**The minimum value of correlation coefficient is _____ .** **(A)** 1 **(B)** -1 **(C)** 0 **(D)** -0.6	B

34.	**Two variables x and y are not linearly correleted if _____ .** **(A)** $r = 0$ **(B)** $r = \pm 1$ **(C)** $r = 0.1$ **(D)** $r = 2$	A
35.	**Two variables x and y are linearly related if _____ .** **(A)** $r = 0$ **(B)** $r = \pm 1$ **(C)** $r = 0.2$ **(D)** None of these.	B
36.	**Which of the following is negative correlation ?** **(A)** Both variables change in the same direction **(B)** Both variables change in the opposite direction **(C)** The graph is a horizontal line **(D)** Sign of correlation coefficient is negative.	B

37. **Which of the following indicates negative correlation ?**

B

(A)
No. of car and no. of accidents in the city

(B)
Price and sale of vehicle

(C)
Rainfall and production of car

(D)
Advertising and sales

38. **Compute correlation coefficient for the following data :**

D

x	4	5	9	14	18	22	24
y	16	22	11	16	7	3	17

(A)
0.5255

(B)
5.2255

(C)
-0.2522

(D)
-0.5255

39. **Following data is given for the curve**

b

$$y = a_0 + a_1 x$$

. Find the value of

$$a_1$$

.

x	1	20	30	40
y	1	400	800	1300

(A)
30.625

(B)
32.625

(C)
27.605

(D)
42.561

40.	**Fit a second degree curve** $$y = a + bx + cx^2$$ **for the following data:** **(A)** $$y = 9.4x + 0.49x^2 + 0.29x^2$$ **(B)** $$y = 9.4 + 0.49x + 0.29x^2$$ **(C)** $$y = 9.4x^2 + 0.49x + 0.29$$ **(D)** $$y = 0.49 + 9.4x + 0.29x^2$$	b

x	1	2	3	4	5
y	10	12	13	16	19

40.	**Fit the least square straight line to the following data:** **(A)** $$y = 4.2 + 8.8x$$ **(B)** $$y = 8.8 - 4.2x$$ **(C)** $$y = -4.2 + 8.8x$$ **(D)** $$y = 4.2x + 8.8y$$	C

x	0	1	2	3
y	0	1	8	27

41.	**If the normal equations for a straight line** $$y = ax + b$$ **are** $$26 = 4a + 6b$$ **and** $$34 = 6a + 4b$$ **then fit the above straight line.** **(A)** $$y = 5x - b$$ **(B)** $$y = 5x + b$$ **(C)** $$y = x + 5b$$ **(D)** $$y = x - 5b$$	B

42.	**Fit the curve** $$y = ae^{bx}$$ **if their normal equations are** $$13.1991 = 4a + 10b$$ **and** $$30.7134 = 10a + 30b$$. **(A)** $$y = -0.4569e^{4.4419x}$$ **(B)** $$y = -404419e^{0.4569}$$ **(C)** $$y = 4.4419e^{-0.4569x}$$ **(D)** $$y = 1$$	C
43.	**In the least square method we use _____ to find the value of unknowns.** **(A)** Regression equations **(B)** Normal equations **(C)** General equations **(D)** Auxiliary equations	b

44.	**Test statistics for correlation coefficient is _____ .** **(A)** # $$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$ # **(B)** # $$t = \frac{r\sqrt{n-2}}{\sqrt{1-n^2}}$$ # **(C)** # $$t = \frac{n\sqrt{r-2}}{\sqrt{1-r^2}}$$ # **(D)** # $$t = \frac{r\sqrt{n-1}}{\sqrt{2-r^2}}$$ #	a
45.	**Consider a hypothesis where $H_0 : \sigma = 30$ and $H_1 : \sigma < 30$ then the test is called .** **(A)** Left tailed test **(B)** Right tailed test **(C)** Center Tailed test **(D)** Cross tailed test	a

46. **Two random samples having the following data:** C

Sample No.	Size
I	# 4 #
II	# 15 #

Test whether the samples come from the same normal population. #

[F for 3 and 4 df is 3.34]

#

(A)
Accept the null hypothesis and both the samples come from the different normal population.

(B)
Reject the null hypothesis and both the samples come from the same normal population.

(C)
Accept the null hypothesis and both the samples come from the same normal distribution.

(D)
None of these.

47.	**For joint probability density function** $$f(x,y) = x^2 \cdot y^3 \; ; \; 0 < x < 1 \; \& \; 0 < y < x,$$ **what is expected value of x?** **(A)** $\frac{4}{32}$ **(B)** $\frac{1}{32}$ **(C)** $\frac{2}{32}$ **(D)** $\frac{3}{32}$	b
48.	**In a company, amount of light bills follows normal distribution with σ = 60. 11.31% of customers pay bill less than 260. What is average amount of light bill?[P(z=1.21)=0.3869]** **(A)** 132.60 **(B)** 232.60 **(C)** 332.60 **(D)** 432.60	C
49.	**The average percentage of failure in a certain examination is 40. What is the probability that out of a group of 6 candidates, at least 4 passed in examination?** **(A)** 0.5443 **(B)** 0.5111 **(C)** 0.4552 **(D)** none of the above	A

50.	**what is "n" for the binomial distribution for which mean is 10 and variance is 5?** **(A)** 10 **(B)** 20 **(C)** 30 **(D)** 40	b
51.	**100 Electric bulbs are found to be defective in a lot of 5000 bulbs. What is probability that at the most 3 bulbs are defective in a box of 100 bulbs?** **(A)** 0.2571 **(B)** 0.4571 **(C)** 0.6571 **(D)** 0.8571	D
52.	**Consider a hypothesis where $H_0 : \sigma = 30$ and $H_1 : \sigma < 30$ then the test is called** **(A)** Left tailed test **(B)** Right tailed test **(C)** Center Tailed test **(D)** Cross tailed test	A
53.	**A statistical abstract reported that 17% of adults attended a musical play in the past year. To test this claim, a researcher surveyed 90 people and found that 22 had attended a musical play in the past year at the 0.05 significance level, test the claim that this figure is corrected.** **(A)** $H_0 = 22$ is accepted **(B)** $H_0 = 22$ is rejected **(C)** $H_0 = 17$ is rejected **(D)** $H_0 = 17$ is accepted	D

54	**The rejection of null hypothesis when it is true is called as .** **(A)** Level of significance **(B)** Level of confidence **(C)** Level of Margin **(D)** Level of rejection	A
55	**Test statistics for correlation coefficient is _____ .** **(A)** # $t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$ # **(B)** # $t = \frac{r\sqrt{n-2}}{\sqrt{1-n^2}}$ # **(C)** # $t = \frac{n\sqrt{r-2}}{\sqrt{1-r^2}}$ # **(D)** # $t = \frac{r\sqrt{n-1}}{\sqrt{2-r^2}}$ # 	A