



# ACE

## Engineering Academy



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H.O: 204, II Floor, Rahman Plaza, Opp. Methodist School, Abids, Hyderabad-500001,

Ph: 040-23234418, 040-23234419, 040-23234420, 040 - 24750437

**ESE- 2018 (Prelims) - Offline Test Series-Test-11**

**ELECTRICAL ENGINEERING**

**SUBJECT: ENGINEERING MATHEMATICS + COMPUTER FUNDAMENTALS  
SOLUTIONS**

**01. Ans: (b)**

**Sol:**

← 32 →			
Opcode	Mode	Register	Address
5	3	6	18

**02. Ans: (b)**

**Sol:** 1206 Byte is available in 75<sup>th</sup> Block

$$16)1206(75$$

$$\begin{array}{r} \underline{112} \\ 86 \\ \underline{80} \\ 06 \end{array}$$

Expression is  $K \text{ Mod } C$

$$75 \text{ Mod } 64 = 11$$

**03. Ans: (d)**

**Sol:** Six processes arrive per minute

Each process requires 8 sec of Service Time

(S.T.)

$$6 \times 8 = 48 \text{ sec}$$

CPU is busy for 48 sec out of 60 sec

$$\% \text{ CPU utilization} = \frac{48}{60} = \frac{4}{5} = 0.8 = 80\%$$

**04. Ans: (d)**

**Sol:** 512 MB with Row size of 32 bit is  $128 \text{ M} \times 32 \text{ bits}$

$$\text{m Number of Rows: } 128 \times 10^6$$

Total time for all Rows is  $128 \times 10^6 \times 10^{-9}$

$$\text{sec} = 128 \text{ ms}$$

**05. Ans: (a)**

**Sol:** Average time =  $T_s$  + time for half revolution

+ time to read a sector is

$$T_a = T_s + \frac{1}{2R} + \frac{N_s}{N_t} \times \frac{1}{R}$$



**06. Ans: (a)**

**Sol:** Address field in the instruction is used to specify Memory Address or one of the processor Register Address.

For example to specify  $R_5$  in a processor which is having 16 Registers from  $R_0$  to  $R_{15}$ , it's Address field is '0101', and for implied Register; no address is specified in the instruction.

**07. Ans: (c)**

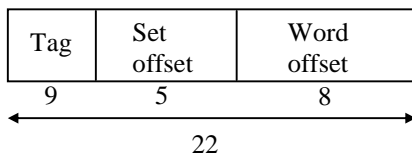
**08. Ans: (c)**

**09. Ans: (c)**

**Sol:** Main memory size =  $2^{14} \times 2^8 B = 2^{22} B$

$$\text{Number of cache sets} = \frac{128}{4} = 32 = 2^5$$

$$\text{Number of words/Block} = 256 = 2^8$$



**10. Ans: (c)**

$$\begin{aligned} \text{Sol: } \log_2 \left( \frac{M}{C} \right) &= \log_2 \left( \frac{4096}{512} \right) = \log_2 8 \\ &= \log_2 2^3 \\ &= 3 \log_2 2 = 3 \end{aligned}$$

**11. Ans: (a)**

**12. Ans: (a)**

**Sol:** In paging, process pages can be stored anywhere in the memory.

Page table is usually stored in memory in the form of pages.

**13. Ans: (d)**

$$\begin{aligned} \text{Sol: Number of chips} &= \frac{\text{Total capacity}}{\text{1 chip capacity}} \\ &= \frac{4096 \text{ Bytes}}{256 \times 1 \text{ bit}} \end{aligned}$$

[Default unit of storage is bits]

$$= \frac{4096 \times 8 \text{ bits}}{256 \times 1 \text{ bit}} = \frac{2^{12} \times 2^3}{2^8 \times 1} = 2^7 = 128$$

**14. Ans: (c)**

**Sol:** Disk scheduler is a part of I/O subsystem of OS.

**15. Ans: (b)**

**Sol:** OS keeps 1 page table entry for each page in page table.

**16. Ans: (b)**

**Sol:** Optimal page replacement policy gives minimum page faults.

**17. Ans: (b)**

**Sol:** Interrupts are not allowed in non-preemptive multiprogramming. Number of processes in main memory is known as degree of multiprogramming.

# Pre GATE-2018

## COMPUTER BASED TEST

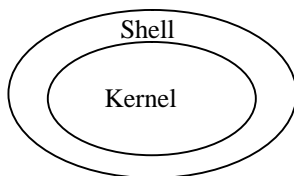
Date of Exam : 20<sup>th</sup> Jan 2018

Last Date To Apply : 05<sup>th</sup> Jan 2018

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18. Ans: (d)

Sol: GUI is the part of shell in OS.



19. Ans: (d)

Sol: In paging  $\Rightarrow$  Page table

In segmentation  $\Rightarrow$  Segment table

For particular implementation either of these two is used.

20. Ans: (b)

21. Ans: (a)

Sol: In one folder two files of same type can not have same name.

22. Ans: (c)

Sol: Cache is known as on-chip or on-board memory.

23. Ans: (c)

Sol: In fixed or variable partition allocation degree of multiprogramming is restricted by number of partitions.



24. Ans: (a)

Sol: Before compilation, some sort of processing is carried out known as pre-processing. In pre-processing stage, all macro calls are substituted with their corresponding macro body.

$$S = 5 + 1 * 5 + 1;$$

$$S = 11$$

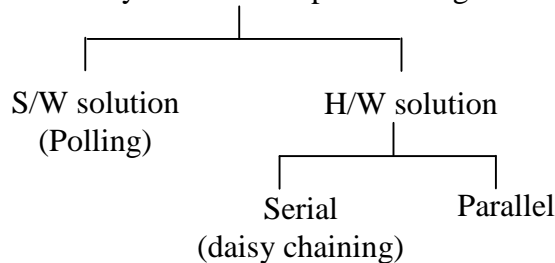
25. Ans: (d)

Sol: All statements are true.

26. Ans: (a)

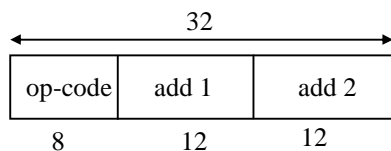
27. Ans: (a)

Sol: Priority based interrupts handling



28. Ans: (b)

Sol: 2-addresses instruction

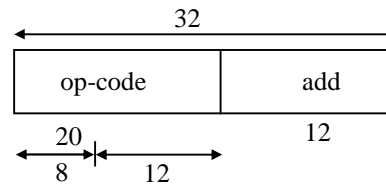


$$\text{Max op-code combinations} = 2^8 = 256$$

$$\text{Used op-code combinations} = 254$$

$$\text{Unused op-code combinations} = 2$$

1-addresses instruction



$$\begin{aligned} \text{Maximum 1-add instructions} &= 2 \times 2^{12} \\ &= 2^{13} \end{aligned}$$

29. Ans: (a)

Sol: To read 32-bits or 4 Bytes memory, time required = 40 nsec

To read 1024 Bytes memory, time required

$$= \frac{40 \text{ nsec}}{4 \text{ Bytes}} \times 1024 \text{ Bytes} = 10240 \text{ nsec}$$

$$= 10.24 \mu\text{sec}$$

30. Ans: (a)

31. Ans: (b)

Sol: Transport Layer = End-to-End Layer = Host-to-Host Layer



# ESE | GATE - 2019

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**32. Ans: (b)**

**Sol:** Given:

$$u = x^3 - 3xy^2 + 3x^2 - 3y^2 + 1$$

$$u_x = 3x^2 - 3y^2 + 6x$$

$$u_y = -6xy - 6y$$

$$\text{Now, } dv = v_x dx + v_y dy$$

$$dv = -u_y dx + u_x dy$$

$$dv = (6xy + 6y) dx + (3x^2 - 3y^2 + 6x) dy$$

$$\int dv = \int (6xy + 6y) dx \quad (\text{integrating}$$

partially w.r.t x)

$$+ \int_c (3x^2 - 3y^2 + 6x) dy \quad (\text{integrating these}$$

terms which do not involve x)

$$\therefore v = 3x^2y + 6xy - y^3 + C$$

**33. Ans: (c)**

$$\text{Sol: } (z^2 + 4)(z^2 - 9) = 0$$

$$\therefore z = \pm 2i, \pm 3 \text{ are singular points}$$

**34. Ans: (b)**

$$\text{Sol: } f(z) = \frac{1 - e^{2z}}{z^4}$$

$$= \frac{1}{z^4} \left\{ 1 - \left( 1 + 2z + \frac{4z^2}{2!} + \frac{8z^3}{3!} + \dots \right) \right\}$$

$$= \frac{1}{z^4} \left\{ -2z - 2z^2 - \frac{4}{3}z^3 - \dots \right\}$$

$$\text{Residue of } f(z) \text{ at } z = 0 = -\frac{4}{3}$$



**35. Ans: (c)**

**Sol:** By the properties of modulus of  $z$  we have

$$z_2 \overline{z_2} = |z_2|^2,$$

$$|z_1 + z_2| \leq |z_1| + |z_2|,$$

$$|z_1 + z_2|^2 + |z_1 - z_2|^2 = 2|z_1|^2 + 2|z_2|^2$$

$\therefore$  Option (c) is wrong.

(i.e., not a property of  $|z|$ )

**36. Ans: (b)**

**Sol:** Consider  $\left| \frac{3+4i}{1-2i} \right| = \left| \frac{3+4i}{1-2i} \right|$

$$\Rightarrow \left| \frac{3+4i}{1-2i} \right| = \frac{\sqrt{9+16}}{\sqrt{1+4}}$$

$$\left| \frac{3+4i}{1-2i} \right| = \frac{5}{\sqrt{5}} = \sqrt{5}$$

**37. Ans: (b)**

**Sol:** Given that  $f(z) = z + z^* = (x+iy) + (x-iy)$

$$\therefore f(z) = 2x$$

But  $z^*$  is continuous and not analytic.

$\therefore f(z)$  is continuous but not analytic function.

**38. Ans: (b)**

**Sol:** i) Transfer one black ball from urn A to urn B and transfer one black ball from urn B to urn A.

ii) Transfer one white ball from urn A to urn B and transfer one white ball from urn B to urn A.

$$\therefore P = \frac{3}{5} \times \frac{4}{10} + \frac{2}{5} \times \frac{6}{10} = \frac{12}{25}$$

**39. Ans: (b)**

**Sol:** We know that  $E(X^2) \geq (E(X))^2$

Let  $E(X) = 2$  and  $E(X^2) = 3$

$$E(X^2) < (E(X))^2$$

$\therefore$  Option (b) does not satisfy  $E(X)^2 \geq (E(X))$

**40. Ans: (c)**

$$\text{Sol: } P(b) = \frac{P(A)P\left(\frac{B}{A}\right)}{P\left(\frac{A}{B}\right)} = \frac{\frac{2}{3} \times \frac{1}{4}}{\frac{1}{2}} = \frac{1}{3}$$

**41. Ans: (c)**

**Sol:**  $P(x=0) = P(x=1)$

$$\frac{e^{-\lambda} \cdot \lambda^0}{0!} = \frac{e^{-\lambda} \cdot \lambda^1}{1!} \Rightarrow \lambda = 1 \Rightarrow E(X) = 1$$

$$V(X) = 1$$

$$E(3x+5) = 3(E(x))+5 = 3(1)+5 = 8$$

**42. Ans: (c)**

**Sol;**  $E(x) = 4;$   $V(x) = 9$

$$E(y) = 0; V(y) = 1$$

$$y = ax - b$$

$$V(y) = a^2 V(x)$$

$$1 = 9a^2 \Rightarrow a^2 = \frac{1}{9}$$

$$\Rightarrow a = \frac{1}{3}$$

**GATE - 2018**

**ONLINE TEST SERIES**

**No. of Tests : 62**

All tests will be available till  
12<sup>th</sup> February 2018

**ESE - 2018 PRELIMS**

**ONLINE TEST SERIES**

**No. of Tests : 44**

All tests will be available till  
07<sup>th</sup> January 2018

**ISRO - 2017**

**ONLINE TEST SERIES**

**No. of Tests : 15**

All tests will be available till  
25<sup>th</sup> December 2017

★ HIGHLIGHTS ★

- Detailed solutions are available.
- **All India rank** will be given for each test.
- Comparison with all India toppers of **ACE** students.

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**43. Ans: (b)**

**Sol:** As per the definition of regression model.

**44. Ans: (a)**

**Sol:** Using Binomial Distribution

Required probability

$$= P(X=2) = 4C_2 \times \left(\frac{1}{2}\right)^2 \times \left(\frac{1}{2}\right)^2 = \frac{3}{8}$$

**45. Ans: (b)**

**Sol:**  $|A| = 0$

$$\begin{vmatrix} 1 & \lambda & -1 \\ \lambda & -1 & -1 \\ 1 & 1 & -\lambda \end{vmatrix} = 0$$

$$\Rightarrow (\lambda + 1) - \lambda(-\lambda^2 + 1) - (\lambda + 1) = 0$$

$$\Rightarrow -\lambda(-\lambda^2 + 1) = 0$$

$$\Rightarrow \lambda = 0, 1, -1$$

$\therefore$  For three values of  $\lambda$ , it has non trivial solution

**46. Ans: (c)**

**Sol:** Let the order of matrix A be  $m \times n$ . Matrix multiplication is possible only when number of columns of first matrix is equal to number rows of second matrix

$$(1 \ 2 \ 3)A = (1 \ 3 \ 4 \ 6 \ 1)$$

$$1 \times 3. \ m \times n = 1 \times 5$$

$$1 \times n = 1 \times 5 \quad (\because m = 3)$$

$$n = 5$$

$\therefore$  The order of A is  $3 \times 5$



**47. Ans: (a)**

**Sol:**  $AA^T = I$

$$|AA^T| = |I|$$

$$|A| |A^T| = 1$$

$$|A|^2 = 1 \quad (\because |A| = |A^T|)$$

$$\therefore |A| = \pm 1$$

**48. Ans: (c)**

**Sol:** We know that a matrix A of order 5 has five eigen values.

But given that three eigen values are zeros

$\Rightarrow$  Out of five eigen values, two eigen values are non-zero eigen values.

But we know that, the number non-zero eigen values is same as rank of that matrix A.

$\therefore$  The rank of matrix A is 2

**49. Ans: (a)**

**Sol:** Consider matrix

$$A = \begin{bmatrix} 1 & -4 & 3 \\ 2 & -5 & 3 \\ 1 & 4 & 0 \end{bmatrix} \sim \begin{bmatrix} 1 & -4 & 3 \\ 0 & 3 & -3 \\ 0 & 8 & -3 \end{bmatrix} \sim \begin{bmatrix} 1 & -4 & 3 \\ 0 & 3 & -3 \\ 0 & 0 & 15 \end{bmatrix}$$

$$\Rightarrow \rho(a) = 3$$

Here the rank of a matrix A is same as the number given vectors.

$\therefore$  The given three vectors are linearly independent vectors

Hence option (a) is correct.

**50. Ans: (a)**

**Sol:** Given that the eigen values of A are

$$\lambda = 1, -2, 4$$

$$\Rightarrow \text{The eigen values of } A^2 \text{ are } \lambda^2 = (1)^2, (-2)^2, (4)^2$$

But the eigen values of  $I_{3 \times 3}$  are 1, 1, 1.

If ' $\lambda$ ' is the general eigen value of  $A_{3 \times 3}$  matrix then  $2 + 3\lambda + \lambda^2$  is the general form an eigen value of matrix of the form  $2I + 3A + A^2$ .

Here one of the eigen value of the matrix  $2I + 3A + A^2$  is zero.

$\therefore$  The matrix  $2I + 3A + A^2$  is singular matrix

**51. Ans: (c)**

**Sol:** Given that  $|A_{4 \times 4}| = 24$

$$\text{we know that } |\text{adj}(A_{n \times n})| = |A|^{(n-1)}$$

$$\Rightarrow |\text{adj}(A_{4 \times 4})| = |A|^{(4-1)}$$

$$\Rightarrow |\text{adj}(A_{4 \times 4})| = |A|^3 = (24)^3$$

$$\therefore |\text{adj}(A_{4 \times 4})| = 15,625$$

**52. Ans: (a)**

**Sol:** Given matrix is  $A = \begin{bmatrix} 3 & 2 \\ 2 & 3 \end{bmatrix}$

$$\text{Consider } |A - \lambda I| = 0$$

$$\Rightarrow \begin{vmatrix} 3-\lambda & 2 \\ 2 & 3-\lambda \end{vmatrix} = 0$$

$$\Rightarrow \lambda^2 - 6\lambda + 5 = 0$$

$$\Rightarrow \lambda = 1, 5 \text{ are eigen values}$$





∴ The larger of the two eigen values of the matrix A is 5.

**53. Ans: (c)**

**Sol:** Given  $\left(\frac{d^2y}{dx^2}\right)^2 = \left[x + \left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}}$

Squaring both sides, we get

$$\left(\frac{d^2y}{dx^2}\right)^4 = \left\{ \left[ x + \left(\frac{dy}{dx}\right)^2 \right]^{\frac{3}{2}} \right\}^2$$

$$\Rightarrow \left(\frac{d^2y}{dx^2}\right)^4 = \left[ x + \left(\frac{dy}{dx}\right)^2 \right]^3$$

Order = 2 and Degree = 4

**54. Ans: (c)**

**Sol:** Given  $x \frac{dy}{dx} + y = 0, y(2) = -2$

$$x \frac{dy}{dx} = -y$$

$$\Rightarrow \frac{dy}{y} = -\frac{dx}{x}$$

$$\Rightarrow \frac{dy}{y} + \frac{dx}{x} = 0$$

Integrating both sides

$$\int \frac{dy}{y} + \int \frac{dx}{x} = \int 0$$

$$\Rightarrow \log y + \log x = c$$

$$\Rightarrow xy = c$$

at  $x = 2$  and  $y = -2 \Rightarrow c = -4$

∴ The solution is  $xy = -4$

**55. Ans: (b)**

**Sol:** Given  $\frac{dy}{dx} = \frac{2x}{x^2 + y^2 - 2y}$

$$\Rightarrow (x^2 + y^2 - 2y)dy = 2x dx$$

$$\Rightarrow (x^2 + y^2)dy - 2y dy - 2x dx = 0$$

$$\Rightarrow (x^2 + y^2)dy - d(x^2 + y^2) = 0$$

$$\Rightarrow dy = \frac{d(x^2 + y^2)}{(x^2 + y^2)}$$

$$\Rightarrow \int dy = \int \frac{d(x^2 + y^2)}{(x^2 + y^2)}$$

∴ The solution is  $y = \log(x^2 + y^2) + C$

**56. Ans: (b)**

**Sol:** Given  $y^{11} + y = 0$

$$\Rightarrow \frac{d^2y}{dx^2} + y = 0$$

The auxiliary equation is

$$D^2 + 1 = 0$$

$$\Rightarrow D = \pm i \text{ are roots}$$

The solution is

$$y = c_1 \cos x + c_2 \sin x \dots \dots \dots (1)$$

$$y(0) = 1, (1) \Rightarrow 1 = c_1 \cos(0) + c_2 \sin(0)$$

$$\Rightarrow c_1 = 1$$

$$y\left(\frac{\pi}{2}\right) = 2$$

$$(1) \Rightarrow 2 = c_1 \cos\left(\frac{\pi}{2}\right) + c_2 \sin\left(\frac{\pi}{2}\right)$$

$$2 = C_2$$



∴ The solutions is  
 $y = \cos x + 2 \sin x$

57. Ans: (d)

Sol:  $(1+t) \frac{dy}{dt} = 4y$

$$\int \frac{1}{y} dy = \int \frac{4}{1+t} dt$$

Log y = 4 log (1+t) + log c

$$y = c(1+t)^4$$

$$y(0) = 1 \Rightarrow 1 = c(1+0)^4 \Rightarrow c = 1$$

$$\Rightarrow y = (1+t)^4$$

58. Ans: (b)

Sol: Order of convergence of secant method = 1.62

Order of convergence of method of false position = 1

Order of convergence of successive approximation method = 1

Bisection method is slowest of all the methods.

∴ Secant method has fastest rate of convergence

59. Ans: (c)

Sol: Let  $x = \frac{1}{a} \Rightarrow \frac{1}{x} = a$

$$\text{Let } f(x) = \frac{1}{x} - a = 0$$

$$f'(x) = -\frac{1}{x^2}$$

Newton – Raphson iteration formula is

$$x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}$$

$$x_{k+1} = 2x_k - a \cdot x_k^2 \dots\dots\dots(1)$$

60. Ans: (a)

Sol:  $f(x) = x^3 - 10x^2 + 31x - 30 = 0$

Dividing f(x) by (x - 5)

$$f(x) = (x - 5)(x^2 - 5x + 6) = 0$$

$$\Rightarrow x = 5, 2, 3$$

∴ The other two roots are 2 & 3

61. Ans: (d)

Sol: All the other methods, we need two initial values near the root.

62. Ans: (d)

$$\text{Sol: } \lim_{x \rightarrow a^-} [x] = a - 1$$

$$\lim_{x \rightarrow a^+} [x] = a$$

$$\lim_{x \rightarrow a} [x] \text{ does not exist}$$

63. Ans: (d)

Sol:  $f(x) = Ax^2 + Bx + C$

By Lagrange's Theorem,

$$\left[ \frac{f(b) - f(a)}{b - a} \right] = f'(\xi)$$



$$\frac{(Ab^2 + Bb + C) - (Aa^2 + Ba + C)}{b - a} = 2A\xi + B$$

$$\frac{A(b^2 - a^2) + B(b - a)}{b - a} = 2A\xi + B$$

$$A(b + a) = 2A\xi$$

$$\therefore \xi = \frac{b + a}{2} \in (a, b)$$

**64. Ans: (b)**

**Sol:** Let  $x^y + y^x = f(xy)$

$$\frac{dy}{dx} = -\frac{f_x}{f_y} = -\left[ \frac{yx^{y-1} + y^x \log y}{x^y \log x + xy^{x-1}} \right]$$

$$\frac{dy}{dx}(1,1) = -\left[ \frac{1+0}{1+0} \right] = -1$$

**65. Ans: (a)**

**Sol:**  $f(x, y) = xy + (x - y)$

$$\frac{\partial f}{\partial x} = y + 1 = 0,$$

$$\frac{\partial f}{\partial y} = x - 1 = 0$$

$$\Rightarrow x = 1, \quad y = -1$$

At  $(1, -1)$

$$r = 0, \quad t = 0, \quad s = 1$$

$$rt - s^2 = 0 - 1$$

$$= -1 < 0$$

$\therefore$  Saddle point is  $(1, -1)$

**66. Ans: (b)**

**Sol:** The directional derivative of

$f(x, y, z) = x^2 - y^2 + 2z^2$  at  $P(1, 2, 3)$  in the direction of  $\vec{PQ}$ , where  $Q = (5, 0, 4)$ , i.e.,

$$\vec{PQ} = 4i - 2j + k$$

$$(\text{grad } \phi)_P \cdot \frac{\vec{PQ}}{|\vec{PQ}|} = (2xi - 2yj + 4zk)_P \cdot \frac{4i - 2j + k}{\sqrt{16 + 4 + 1}}$$

$$= (2i - 4j + 12k) \cdot \frac{(4i - 2j + k)}{\sqrt{21}}$$

$$= \frac{8 + 8 + 12}{\sqrt{21}} = \frac{28}{\sqrt{21}}$$

**67. Ans: (c)**

**Sol:** If  $\vec{V}$  is solenoidal, then

$$\text{div } \vec{V} = 0$$

$$\Rightarrow 1 + 1 + a = 0$$

$$\Rightarrow a = -2$$

**68. Ans: (b)**

**Sol:** By using Gauss divergence theorem,

$$\iint_S (\vec{r} \cdot \hat{n}) ds = \iiint_V \text{div}(\vec{r}) dv = \iiint_V 3 dx dy dz$$

$$= 3 \times \text{volume of the unit sphere}$$

$$= 3 \times \frac{4}{3} \pi (1)^3$$

$$= 4\pi$$

**69. Ans: (a)**

$$\text{Sol: } f(x) = \frac{\sin x \cdot \cos x}{|\cos x|} dx$$

$$f(-x) = \frac{-\sin x \cdot \cos x}{|\cos x|}$$



$$= -f(x)$$

$\therefore f(x)$  is a odd function

$$\therefore f(x) = 0$$

**70. Ans: (c)**

$$\begin{aligned} \text{Sol: } L^{-1} \left\{ \frac{s+1}{(s^2+2s)} \right\} &= L^{-1} \left\{ \frac{s+1}{s(s+2)} \right\} \\ &= L^{-1} \left\{ \frac{A}{s} + \frac{B}{(s+2)} \right\} \end{aligned}$$

$$\text{where } A = \frac{1}{2} \text{ and } B = \frac{1}{2}$$

$$= \frac{1}{2} (1 + e^{-2t})$$

**71. Ans: (b)**

**Sol:** By second shifting Theorem, we have

$$L \{ f(t-T) \} = e^{-sT} F(s)$$

**72. Ans: (a)**

**73. Ans: (d)**

**Sol:** Multitasking OS uses Round-Robin scheduling for process execution.

**74. Ans: (b)**

**Sol:** Both Statements are correct but Statement (II) is not reason of Statement (I).

**75. Ans: (a)**

**Sol:** All files are contained in same directory, hence to uniquely identify a file, each file should have unique name.

# GATE TOPPERS

**GATE 2017**

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2 CE PUNEET KHANNA	2 IN SAHIL MAHATO	2 IN SHEKHAM BANSAL	2 PI GAURY DHAURVAL	3 EC KARUN	3 EE RAVI TEJA	3 ME PRADIP BOBADE	3 CS RAVI SHANKAR
3 CE AJEELK TRIPATHI	4 EC SONU SHARMA	4 EE SARFRAJ NAWAZ	4 CE CHIRAG MITTAL	4 ME GAUSH ALAM	4 IN MONTI	4 PI Sanghavi Adhikari	5 IN VRAJESH SHAH
5 PI ANKIT TIWARI	6 EC LROJITA SALUPLU	6 CS MEGHASHAYAM	6 EE RAJESHKAR BEDIY	6 IN RAMESH KAMUJA	6 PI PRAL KUMAR RANA	7 IN PANKAJ AWISHRA	8 ME DIPKANTHU JHA
8 PI Mona Bhargava	9 EC Anand Upadhi	9 CS Nikhil Nandan Saha	9 ME DHRUP KUMAR SAA	10 EC AMIT BAWAZ	10 ME ANIKH KUMAR	10 EE SURAJ DASH	10 IN PRANAV KUMAR

# ESE TOPPERS

**ESE 2017**

(CE)	(E&T)	(EE)	(ME)
<p>1 CE NAMIT JAIN</p> <p>2 CE PRAVIND SINGH</p> <p>3 CE ANKIT</p> <p>6 CE SHIBIRI BHARGAVACH</p> <p>8 CE ADITYA SINGH</p> <p>9 CE HIMANSHU GAUTAM</p> <p>10 CE AYUSHI DUBEY</p>	<p>2 E&amp;T RISHABHENDU CHANDRABABY</p> <p>3 E&amp;T ARJUN SHINHWALU</p> <p>5 E&amp;T ANIL GAUTAM</p> <p>6 E&amp;T SUDHANSHU MEHRA</p> <p>7 E&amp;T DEWANSINGH NIKHIL KUMAR</p> <p>8 E&amp;T DEEPAJI GOYAL</p> <p>9 E&amp;T ABHIRAM PRASAD SINGH</p> <p>10 E&amp;T UMESH</p>	<p>2 EE PREETI KUMARI</p> <p>3 EE SANGHVI SIDDHI</p> <p>4 EE HARSHIT KUMAR SINGH</p> <p>5 EE NIGEL KUMAR</p> <p>6 EE DUSHYANT SINGH</p> <p>8 EE APOORVA GUPTA</p> <p>9 EE KIRAN BASU KONESU</p>	<p>3 ME SAURASH</p> <p>4 ME AMIT KUMAR RAJ</p> <p>6 ME ANKAN GUPTA</p> <p>7 ME DHRUV JHA</p> <p>9 ME ACHARAJ GUPTA</p>
<p><b>7</b> All India 1<sup>st</sup> Rank in ESE.</p>	<p><b>8</b> IN TOP 10 RANKS and many more...</p>	<p><b>7</b> IN TOP 10 RANKS</p>	<p><b>5</b> IN TOP 10 RANKS</p> <p><b>27</b> Ranks in Top 10 in ESE-2017</p>



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