



ACE Engineering Academy



Hyderabad | Delhi | Bhopal | Pune | Bhubaneswar | Bengaluru | Lucknow | Patna | Chennai | Vijayawada | Visakhapatnam | Tirupati | Kukatpally | Kolkata

H.O: 204, II Floor, Rahman Plaza, Opp. Methodist School, Abids, Hyderabad-500001,
Ph: 040-23234418, 040-23234419, 040-23234420, 040 - 24750437

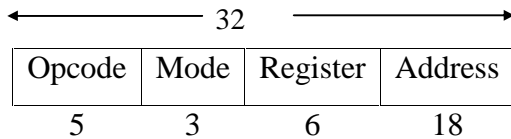
ESE- 2018 (Prelims) - Offline Test Series **Test- 11**
ELECTRONICS & TELECOMMUNICATION ENGINEERING

**SUBJECT: COMPUTER ORGANIZATION AND ARCHITECTURE
+ ADVANCED COMMUNICATION + ADVANCED ELECTRONICS**

SOLUTIONS

01. Ans: (b)

Sol:



02. Ans: (b)

Sol: 1206 Byte is available in 75th Block

$$16 \times 75 = 1200$$

$$\underline{112}$$

$$86$$

$$\underline{80}$$

$$\underline{06}$$

Expression is K 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: (a)

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

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

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

05. Ans: (a)

Sol: Average time = T_s + time for half revolution + time to read a sector is

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

Pre GATE-2018

COMPUTER BASED TEST

Date of Exam : 20th Jan 2018

Last Date To Apply : 05th Jan 2018

www.aceenggacademy.com

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: (a)

Sol: AC is a key and AD B is a transitive dependency.

09. 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.

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

$$S = 11$$

10. 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.

11. Ans: (c)

Sol: Precedence graph for the schedule is $T_1 \ T_2$.



12. Ans: (b)

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

13. Ans: (b)

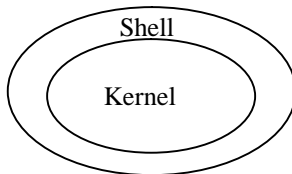
Sol: Optimal page replacement policy gives minimum page faults.

14. Ans: (b)

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

15. Ans: (d)

Sol: GUI is the part of shell in OS.



16. Ans: (d)

Sol: Transaction T_3 performs read on A, which is updated by T_1 and committed before T_1 does.

17. Ans: (d)

Sol: In paging \Rightarrow Page table

In segmentation \Rightarrow Segment table

For particular implementation either of these two is used

18. Ans: (c)

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

19. Ans: (a)

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

20. Ans: (c)

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

21. Ans: (a)

Sol:
$$\frac{nh}{nh + m} \times 100$$

$$n = 5, m = 1000, h = 10.$$

$$= \frac{5 \times 10}{50 + 1000} \times 100$$

$$= \frac{50 \times 100}{1050} = 4.76\%$$

22. Ans: (b)

23. Ans: (c)

Sol: $e = 5, p = 7, q = 17$

$$z = 6 \times 16 = 96$$

$$(e \times d) = 1 \pmod{z} = e = 5$$

$$(e \times d) = \text{multiple of } 96 + 1$$

$$i = 1 \quad 96 \times 1 + 1 = 97 \pmod{96} = 1$$

$$e \times d = 97; d = 97/5 = \text{fraction}$$

$$i = 2 \quad 96 \times 2 + 1 = 193$$

$$e \times d = 193 \text{ fraction}$$

$$i = 3 \quad 96 \times 3 + 1 = 289$$

$$e \times d = 289 \text{ fraction}$$

$$i = 4 \quad 96 \times 4 + 1 = 385$$

$$e \times d = 385 \quad d = \frac{385}{5} = 77$$



ESE | GATE - 2019

LONG TERM BATCHES

EC | EE | ME | CE | CS | IN | PI

Start Early, Gain Surely



Pioneer to Leader



Dedicated Service



Experienced Faculty from Central Pool

Admissions are open at all our centers

H. O. : Hyderabad : Ph : 040-23234418,19,20

Bangalore 9341299966	Kukatpally 040-6597 4465	Delhi 9205282121	Bhopal 0755-2554512	Pune 020-25535950	Bhubaneswar 0674-2540340	
Lucknow 808199966	Patna 9308699966	Chennai 044-42123289	Vijayawada 0866-2490001	Vishakapatnam 0891-6616001	Tirupathi 0877-2244388	Kolkata 8297899966

24. Ans: (a)

Sol: $x = 100000$ bits

$p = 1000$ bits

$b = 50$ kbps

$d = 250$ ms per hop

$k = 3$

$$\text{Delay} = \frac{x}{b} + kd + (k-1)\frac{p}{b}$$

$$= 2000 + 3(250) + (3-1)20$$

$$= 2790 \text{ ms}$$

25. Ans: (c)

Sol: T_1 carrier

Bit rate

$$= \frac{24 \times (7 \text{ bits} + 1 \text{ parity bit}) + 1 \text{ sync.bit}}{\text{One sample time} = 125 \mu\text{s}}$$

$$= \frac{24 \times 8 + 1}{125 \mu\text{s}} = \frac{193}{125} = 1.544 \text{ Mbps}$$

26. Ans: (a)

Sol: TCP MSS

IP MTU



27. Ans: (c)

28. Ans: (d)

29. Ans: (a)

30. Ans: (d)

Sol: Total number of modes

$$M = \frac{\alpha}{\alpha + 2} \frac{V^2}{2}$$

$$M = \frac{1}{2} \frac{\alpha}{\alpha + 2} \left(\frac{2\pi a}{\lambda} \text{NA} \right)^2$$

Total number of modes depends on core radius (a), wavelength of the optical source (λ) and refractive index profile (α).

So, Ans is d

31. Ans: (c)

Sol: The FOM of an earth station in satellite communication system is primarily depends on G/T ratio

32. Ans: (b)

Sol: Given that

$$\left(\frac{S}{N} \right)_1 = \left(\frac{S}{N} \right)_2 = 60\text{dB} = 10^6$$

$$\left(\frac{S}{N} \right)_3 = 40\text{dB} = 10^4$$

overall $\left(\frac{S}{N} \right)$ is

$$\frac{1}{\left(\frac{S}{N} \right)_{\text{ov}}} = \frac{1}{\left(\frac{S}{N} \right)_1} + \frac{1}{\left(\frac{S}{N} \right)_2} + \frac{1}{\left(\frac{S}{N} \right)_3}$$

$$\frac{1}{\left(\frac{S}{N} \right)_{\text{ov}}} = \frac{1}{10^6} + \frac{1}{10^6} + \frac{1}{10^4}$$

$$\left(\frac{S}{N} \right)_{\text{ov}} = \frac{1}{2 \times 10^{-6} + 10^{-4}} = \frac{1}{0.000102}$$

$$\left(\frac{S}{N} \right)_{\text{ov}} = 9803.92$$

$$\left(\frac{S}{N} \right)_{\text{ov}} = 39.91\text{dB}$$

$$\left(\frac{S}{N} \right)_{\text{ov}} \cong 40\text{dB}$$

33. Ans: (a)

Sol: We know that radar range is directly proportional to square root of the aperture area

$$R \propto \sqrt{A}$$

$$\frac{R_2}{R_1} = \sqrt{\frac{A_2}{A_1}}$$

Since the aperture of the radar antenna is doubled so $A_2 = 2A_1$

$$\frac{R_2}{R_1} = \sqrt{\frac{2A_1}{A_1}}$$

$$R_2 = \sqrt{2} R_1$$

34. Ans: (d)

Sol: Doppler effect is used to find out the target velocity which is used in both CW radar and MTI radar.

35. Ans: (d)

Sol: $P_R \propto \frac{1}{d^4}$

$$\frac{P_{R2}}{P_{R1}} = \frac{d_1^4}{d_2^4} = \left(\frac{d}{2} \right)^4 = 16$$

$$P_{R2} = 16 P_{R1}$$

GATE - 2018

ONLINE TEST SERIES

No. of Tests : 62

All tests will be available till
12th February 2018

ESE - 2018 PRELIMS

ONLINE TEST SERIES

No. of Tests : 44

All tests will be available till
07th January 2018

ISRO - 2017

ONLINE TEST SERIES

No. of Tests : 15

All tests will be available till
25th December 2017

★ HIGHLIGHTS ★

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

www.aceenggacademy.com

testseries@aceenggacademy.com

36. Ans: (c)

37. Ans: (a)

38. Ans: (c)

Sol: It is a method of transmission and reception used to minimize the effects of selective fading of the horizontal and vertical components of a radio signal.

39. Ans: (c)

Sol: Duplexer is used to enable the common antenna for transmission and reception as well as to protect the receiver when high power signal is transmitted

40. Ans: (c)

Sol: Gain of the Dish antenna is

$$G = k\pi^2 \left(\frac{D}{\lambda}\right)^2, \text{ where } D = \text{Diameter}$$

$$G \propto D^2$$

$$\frac{G_2}{G_1} = \left(\frac{D_2}{D_1}\right)^2$$

$$G_2 = G_1 \left(\frac{D_2}{D_1}\right)^2$$

Given $G_1 = 30\text{dB} = 10^3$, $D_2 = 10\text{m}$, $D_1 = 1\text{m}$

$$G_2 = 10^3 \left(\frac{10}{1}\right)^2 = 10^5 = 50\text{dB}$$

41. Ans: (a)

Sol: The relation between f_{muf} and f_c is

$$f_{\text{muf}} = f_c \sec\phi$$

$$f_{\text{muf}} = f_c \sec 60^\circ = 2f_c$$



42. Ans:(d)

Sol: In GSM total bandwidth is divided into 200kHz bandwidth slots. So it is FDMA. Again 200kHz bandwidth allocated to 8 users in time slots. So GSM uses both TDMA and FDMA.

43. Ans:(c)

Sol: Transmission antenna height $h_t = 196\text{m}$

Reception antenna height $h_r = 49\text{m}$

Maximum possible link distance

$$\begin{aligned}d &= 4.12(\sqrt{h_t} + \sqrt{h_r}) \\ &= 4.12(\sqrt{196} + \sqrt{49}) \\ d &= 86\text{Km}\end{aligned}$$

44. Ans: (c)

45. Ans: (b)

46. Ans:(c)

Sol: (a) In soft hand-off there is no user's connection to be broken if we go from one cell site to another cell site. So it is **make-before-break**.

(b) In Hard hand-off there is user's connection to be broken if we go from one cell site to another cell site. So it is **break-before-make**.

47. Ans: (c)

48. Ans: (b)

49. Ans: (d)

Sol: As oxide thickness increases, it requires high voltage to invert the channel. Hence, threshold voltage increases

50. Ans:(a)

Sol: Fixed positive charges act as the positive gate to source voltage. Hence, threshold voltage decreases.

51. Ans: (d)

52. Ans: (b)

53. Ans: (b)

54. Ans: (a)

55. Ans: (c)

Sol: Scan chain introduces additional flip-flops and MUX and there by adding routing delay and area overhead.

56. Ans: (b)

Sol: At each node, we need two test vectors. Hence, at most '2m' test vectors are required.

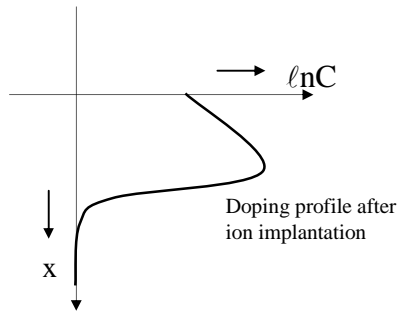
57. Ans: (d)

58. Ans:(d)

Sol: Clock period
 $= 40 + 50 + 60 + 30 + 50$
 $= 230\text{units of time}$



59. Ans: (c)



60. Ans: (c)

Sol: A Latch up is the generation of a low-impedance path in CMOS chips between power supply and ground rails due to interconnection of parasitic pnp and npn bipolar transistors

B Channeling occurs when some ions travel across the substrate and don't collide with the atoms in the lattice.

D in EBL-Pattern developed is wider than that of the desired pattern due to proximity effect

61. Ans: (d)

62. Ans: (c)

63. Ans: (a)

Sol: Birds beak problem occurs due to isotropic nature of Si-oxidation in LOCOS process only.

64. Ans: (b)

65. Ans: (a)

66. Ans: (a)

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

67. Ans: (d)

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

68. Ans : (a)

69. Ans: (d)

Sol: In I/O mapped IO, maximum number of IO devices that can be addressed by the CPU is 512 when it's port address size is 8 bit

70. Ans: (d)

Sol: Pipeline doesn't reduce the time taken to perform an individual task but it achieves speed up by processing the tasks in parallel.

71. Ans: (a)

72. Ans: (a)

73. Ans:(a)

74. Ans:(b)

Sol: In ion implantation, high velocity dopant ions collide with the host atoms resulting in the lattice damages.

75. Ans: (a)

GATE TOPPERS

GATE 2017

1 EC PRAMOD	1 ME SUDHEER	1 ME HASAN ASIF	1 EE SHYAM SINGH	1 CE MIRZA RAKESH	1 CS DEVAL N PATEL	1 IN NAVEEN	2 EC SREE KALYANI
2 CE PUNEET KHANNA	2 IN RAHUL MAHATO	2 IN SHUBHAM BANSAL	2 PI GAURAV DHAMDEJAL	3 EC KARUN	3 EE RAVI TEJA	3 ME PRADIP BOBADE	3 CS RAVI SHANKAR
3 CE ANKUR TRIPATHI	4 EC SONU SHARMA	4 EE SARFRAJ NAWAZ	4 CE CHIRAG MITTAL	4 ME GAUSH ALAM	4 IN MONTI	4 PI Sanghamitra Adhikari	5 IN VRAJESH SHAH
5 PI ANKIT TIWARI	6 EC LROHITA SHARMA	6 CS MEGHASHAYAM	6 EE RAJASEKHAR EGODY	6 IN RAKESH KAMALLA	6 PI PENAL KUMAR RANA	7 IN RANJAY MISHRA	8 ME DITYANSHU BIA
8 PI Mony Bhargava	9 EC Anand Upadhye	9 CS Hitesh Kumar Saha	9 ME SHREYAS KUMAR JAIN	10 EC ANIL KAWAL	10 ME ANANT KUMAR	10 EE SURAJ DASH	10 IN VIBHAK SHINDE

ESE TOPPERS

ESE 2017

CE		E&T		EE		ME	
1 CE NAMIT JAIN	2 CE PRASAD SINGH	2 E&T KUSHANSHU CHAUDHARY	3 E&T ARUNDEEN BANWAL	2 EE PRIYATI KUSHWAH	3 EE NANUJ KUMAR SINGH	3 ME SAURASH	4 ME ANIL KUMAR BIA
3 CE ANKIT	6 CE SUNJAY DASHRATH	5 E&T ANIL GAUTAM	6 E&T SUSHANSHU MISHRA	4 EE RANDEET KUMAR SINGH	5 EE NIRAJ KUMAR	6 ME ANJAN GUPTA	7 ME DHEERAV JHA
8 CE ADITYA SINGH	9 CE HIRANSHU GAUTAM	7 E&T DEVDURGAM PRAJAPATI	8 E&T DEEPA GOYAL	6 EE DUSHYANT SINGH	8 EE APOORVA GUPTA	9 ME ADARSH GUPTA	
10 CE AVUSHI DUBEY	7 IN TOP 10 RANKS	9 E&T ADARSH PRASAD SINGH	10 E&T LIMESH	9 EE NIRAN DABHU SONERU			5 IN TOP 10 RANKS
 7 All India 1 st Rank in ESE.		8 IN TOP 10 RANKS and many more...		7 IN TOP 10 RANKS		 27 Ranks in Top 10 in ESE-2017	



ACE

Engineering Academy
Leading Institute for ESE/GATE/PSUs