

Total No. of Questions : 8]

SEAT No. :

P2960

[Total No. of Pages : 3

[5669]-550

T.E. (E&TC)

SPOS (System Programming & Operating System)

(2015 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 or Q.2 & Q.3 or Q.4 & Q.5 or Q.6 & Q.7 or Q.8.
- 2) Figures to right indicate full marks

- Q1)** a) Explain phases of compiler with suitable example. [7]
- b) What is MACRO? What is significance of using MACRO over 'function' in typical cases. Hence explain the processing of MACRO call by MACRO Processor. [7]
- c) Consider following processes where arrival time & burst time is as shown compute avg waiting time & turnaround time using SJF algo. [6]

Process	Burst Time	Arrival Time
P <sub>1</sub>	10	01
P <sub>2</sub>	06	01
P <sub>3</sub>	05	01

- Q2)** a) What is need of code optimization? Explain one code optimization method with suitable example. [7]
- b) Define following w.r.t. significance of operation. [6]
- i) Loader
  - ii) Linker
  - iii) Compiler
  - iv) Assembler
- c) What is significance of an operating system enlist different types of OS w.r.t. it's functionalities. [7]

P.T.O.

- Q3) a)** What is need of concurrency control mechanism & write a note on: [6]
- Producer consumer problem.
  - Dinning philosopher problem
- b) Explain process state transition diagram. [4]
- c) An o.s. contains 3 resources the number of instance of each resource type are 7,7,10 the current resource allocation state is as shown. [6]

	Current allocation.			Max. Need		
	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
P <sub>1</sub>	2	2	3	3	6	8
P <sub>2</sub>	2	0	3	4		3
P <sub>3</sub>	1	2	4	3	4	4

- Is current allocation safe?
  - Can request made by P<sub>1</sub> (1 1 0) be granted?
- Q4) a)** What is deadlock in o.s. explain in brief methods for dead lock prevention. [6]
- b) Find out safe sequence for execution of following processes using bankers algo. [6]

Max resource R<sub>1</sub> = 4 R<sub>2</sub> = 4

	allocation matrix		Max. required matrix	
	R <sub>1</sub>	R <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>
P <sub>1</sub>	1	0	1	1
P <sub>2</sub>	1	1	2	3
P <sub>3</sub>	1	2	2	2

- c) Give difference between process & thread on 4 points. [4]

- Q5) a)** Consider following string for page frames. [6]  
2 3 2 1 5 2 4 5 3 2 5 2  
Number of frames = 3 calculate page fault and hit ratio using FiFO page replacement algo.
- b) Explain difference between contiguous memory allocation and non contiguous memory allocation. [4]
- c) What is paging? Explain concept of paging with TLB. [6]
- Q6) a)** Paging system consists of physical memory  $2^{24}$  bytes, pages of logical address space is 256 page size of  $2^{10}$  bytes, How many bits are in logical address. [4]
- b) Give difference between paging & segmentation. [6]
- c) Consider following string of page reference page frame size 4, calculate page fault. 0123012301234567 using LRU. [6]
- Q7) a)** Explain types of I/O buffering. [8]
- b) Explain mechanism of direct mem access with block diagram. [6]
- c) Explain I/O software layers. [4]
- Q8) a)** Write a note on RAID disc. [6]
- b) Explain Linux file system. [6]
- c) Explain file attributes. [6]

