Marks Scored:

KATHMANDUUNIVERSITY
End Semester Examination[C]
November, 2017

Level : B. E.
Year : IV
Course : ETEG 417
Semester : II
Exam Roll No. :
Time: 30 mins.
F. M. : 20
Registration No. :
Date NOV : 15 2017

SECTION "A"
[20 Q. × 1=20 marks]

Choose the most appropriate option.

1. In packet switching , packets of different messages are interleaved on an outgoing circuit and a…….message does not wait for the transmission of a…… message to be completed.
a) short, long
b) long, short
c) encrypted, long
d) transmitted, short

2. In ……..switch ,the magnets which operate the horizontal bars are called select magnets and those operating the vertical bars are called……
a) bridge magnet, select magnet
b) bridge magnet, hold magnet
c) crossbar, hold magnets
d) off selector, cross magnet

3. ……signaling must be protected against false operation by speech.
a) outband
b) inter-register
c) intra-register
d) inband

4. In distributed SPC ……processor handles scanning, distribution and marking functions.
a) level 1
b) level 2
c) level 3
d) level 4

5. In level 3 processing of distributed SPC, processing results in the setting or sensing of one or more binary conditions in ……or registers.
a) flipflops
b) buffer
c) level 3 memory
d) sensor

6. In ……decomposition ,each processor performs only one or some of the exchange control functions.
a) horizontal
b) vertical
c) centralised
d) continuous

7. ……processor is termed as switching processor.
a) level 1
b) level 2
c) level 3
d) level 4

8. CCR is defined as the ratio of the number of ……to the number of call attempts.
a) arriving calls
b) lost calls
c) successful calls
d) delayed calls

9. What is the signaling rate of TDM T1 systems.
a) 64 kbps
b) 8 kbps
c)125 kbps
d)56 kbps

10. ……model assumes that a subscriber on hearing the engaged tone ,hangs up and waits for some length of time before reattempting.
a) LCR
b) LCC
c) LCH
d) LCCH

11. Erlang loss formula was derived under a fundamental assumption that a ..... are independent of the number of active callers.
a) lost calls b) delayed calls c) waiting calls d) call arrivals

12. For Engset traffic, the blocking probability and GOS are.....
a) same b) different
c) almost same d) independent of arriving calls

13. In lost calls returned system, offered traffic is equal to the summation of.....
a) new traffic and retry traffic b) carried traffic and new traffic
c) lost traffic and retry traffic d) delay traffic and retry traffic

14. Outband signaling uses the frequencies above the voice band but below the upper limit of ..... of the nominal voice channel spacing.
a) 3400 Hz b) 300 Hz c) 4000 Hz d) 4100 Hz

15. .....carries SS7 signaling over IP.
a)VOIP b) Signaling Gateway c) SIGTRAN d) TCP

16. If..... transmission is used with .....tandem switching ,it is necessary to provide demultiplexing equipment to demodulate every channel to audio before switching and multiplexing equipment to retransmit it after switching.
a)Frequency division, time division b)wavelength division, time division
c)space division, time division d)time division, space division

17. In the past ,the engineers counted the plugs inserted in a manual switchboard or the number of selectors off-normal in an automatic exchange to measure the traffic and the results were known as.....
a) peg count b) crosspoint c) cross count d) hold count

18. If the first stage has a .....input and a..... distribution of holding times, the input to the second and subsequent stages are also poissonian.
a) binomial, poisson b) truncated poissonian, binomial
c) poissonian, negative-exponential d) poissonian, erlang-k

19. ..... receive and route incoming signaling message toward the proper destination.
a) SSP b) STP c) SCP d) SCCP

20. If the traffic forecast is wrong and the traffic .....than expected, the GOS will exceed the specified value before the end of the provision period.
a) grows faster b) grows slower
c) offered exceeds d) intensity increases

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SECTION "B"

[5 Q. × 11= 55 marks]

Attempt *ANY FIVE* questions.

1. a. Differentiate circuit switching and packet switching techniques on the basis of theiroperation and circuit connection diagram between calling and called party. [7]
   b. Define distributed SPC. Explain the event monitoring and distribution processor in brief. [4]

2. a. Draw the block diagram of hypothetical digital switch.Explain the function of borscht circuit and system controller in brief. [7]
   b. A message switching network is to be designed for 90% utilization of its transmissionlink. Assuming exponential distributed message lengths and an arrivals rate of 10 message per minute. What is the average waiting time and what is the probability that the waiting time exceeds 3 minutes. [4]

3. a. Differentiate call processing in analog subscriber signalling and digital subscribersignalling system with figure. [7]
   b. Assume that a trunk group has enough channels to immediately carryall of the traffic offered to it by a poisson process with an arrival rate of one call per minute. If the average holding time is 2 minute.What percentage of the total traffic is carried by the first five circuits,and howmuch traffic is carried by all remaining circuits? [4]

4. a. Explain the theory of lost call system.Derive the formula for Erlang's lost call for a full availability group of n trunks offered traffic A erlangs. [7]
   b. During the busy hour, 1200 calls were offered to a group of trunks and six calls were lost.The average call duration was 3 minutes, find the traffic lost. [4]

5. a. Explain infinite queue length single server M/M/1:∞/∞ model and derive the relation $P_n=\rho^n(1-\rho)$.
   b. A rural telephone exchange normally experiences four call originating per minute. What is the probability that exactly eight calls occur in anarbitrarily chosen interval of 30 seconds? [4]

6. a. Define Erlang delay system. Explain waiting time distribution system in brief. [5]
   b. Write short notes on: [3 × 2 = 6]
      i) Moe's principle for delay system
      ii) Time division switching