

POLITEKNIK
Jabatan Pengajian Politeknik

EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION
(MINISTRY OF HIGHER EDUCATION)

ELECTRICAL ENGINEERING DEPARTMENT

FINAL EXAMINATION

JUNE 2012 SESSION

EP302: TELEPHONY

DATE :20 NOVEMBER 2012(TUESDAY)

DURATION : 2 HOURS (11.15 AM - 1.15 PM)

This paper consists of **ELEVEN (11)** pages including the front page.

Section A1 : Objective (10 questions)

Section A2 : Fill in the blank (10 questions)

Section B : Structured (10 questions)

Section C : Essay (2 questions)

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BY THE CHIEF INVIGILATOR**

(The CLO stated is only for reference only)



SECTION A (20 MARKS)**SECTION A1 : OBJECTIVE (QUESTION 1 – QUESTION 10)****INSTRUCTION:**

This section consists of 10 objective questions. Write your answers in the answer booklet.

1. The telephone network is made by several major components.

What are the major components?

[CLO 1]

- A. Instruments, local loop and exchange
- B. Instruments, exchange and transmission medium
- C. Instruments, local loop, trunk circuit, exchange and transmission medium
- D. Instrument only

2. PBX stands for:

[CLO 1]

- A. Private Branch Telephone
- B. Private Branch Exchange
- C. Public Branch Exchange
- D. Private Bell Exchange

3. Name the type of crossbar switching shown in Figure 1

[CLO 1]

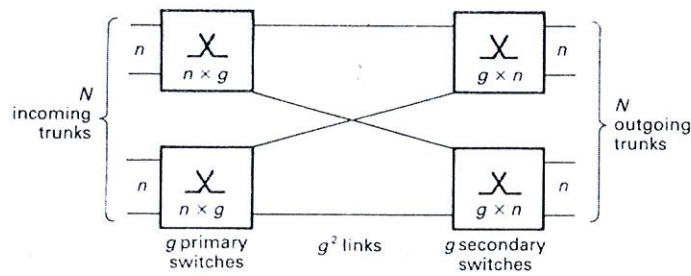


Figure 1

- A. 3-Stage Network
 - B. 2-Stage Network
 - C. Multistage Network
 - D. None of the above
4. Which of the following answers is the function of a switch? [CLO 1]
- A. Notify the subscriber when there is an incoming call
 - B. Sets up the communication path
 - C. Regulates the amplitude and frequency response of the voice signals
 - D. Converts a two-wire circuit into a four-wire circuit and vice versa
5. Time Division Multiplexing (TDM) carrier systems are growing in number because: [CLO 1]
- A. Their error rates can be made very low
 - B. They can use low-cost, large scale integrated circuits
 - C. They can carry signals other than voice
 - D. All of the above

9. A line has a grade of service 0.25 and it can only allow 820 outgoing call when lines are busy. Calculate the number of calls that can run on this line. [CLO 1]
- A. 1030 call
 - B. 1039 call
 - C. 1093 call
 - D. 1000 call
10. Calculate the call intensity for telephony system with a total number of 2000 traffic in the average time of 2 minutes. [CLO 1]
- A. 16.67
 - B. 76
 - C. 16
 - D. 67.16

SECTION A2 : FILL IN THE BLANK (QUESTION 11 – QUESTION 20)

INSTRUCTION: This section consists of 10 objective questions. Write your answers in the answer booklet.

11. Trunks are the lines that run between _____. [CLO 1]
12. The media that can transmit information in the telephony system is _____. [CLO 1]
13. Switching process normally occurs at _____. [CLO 1]
14. A local telephone network is an example of a _____ network [CLO 1]
15. The noise generated by Time Division Multiplexing(TDM) carrier system is _____ than that generated by analog carrier system. [CLO 1]
16. _____ Division Multiplexing is the transmission of information signal using fiber optic cable. [CLO 1]
17. Subscriber signaling is signaling between _____ and _____. [CLO 1]
18. Session Initiation Protocol is a signaling protocol used to _____, _____ and terminate sessions in an IP based network. [CLO 1]
19. When all circuits on the route are busy, some calls are unsuccessful. This condition is known as _____. [CLO 1]

20. _____ is the average number of calls in progress
and the unit is Erlang.

[CLO 1]

SECTION B**STRUCTURED (10 QUESTION)****INSTRUCTION:**

This section consists of **TEN (10)** structured questions. Answer **ALL** the questions.

QUESTION 1

State **THREE (3)** major components of a telephone network . [CLO 1]

(3 marks)

QUESTION 2

State **THREE (3)** basic functions of a standard telephone set. [CLO 1]

(3 marks)

QUESTION 3

List **THREE (3)** functions of a switching system. [CLO 1]

(3 marks)

QUESTION 4

State **THREE (3)** components in the block diagram of Stored Program Control.

[CLO 1]

(3 marks)

QUESTION 5

Describe Synchronous Time Division Multiplexing(TDM). [CLO 1]

(3 marks)

QUESTION 6

List **TWO (2)** differences between Synchronous Optical Network (SONET) and Synchronous Digital Hierarchy (SDH).

[CLO 1]

(3 marks)

QUESTION 7

There are two types of subscriber signaling which are forward signal and backward signal. Identify **THREE (3)** types of signals found in backward signal.

[CLO 1]

(3 marks)

QUESTION 8

List **THREE (3)** signaling categories in the Telephone Network.

[CLO 1]

(3 marks)

QUESTION 9

State **THREE (3)** differences between Erlang and Common Channel Signaling (CCS).

[CLO 1]

(3 marks)

QUESTION 10

Calculate the traffic in Erlangs and CCS for a trunk group carrying 1000 calls during the busy hour with an average call-holding time of 3 minutes.

[CLO 1]

(3 marks)

b) During busy hour, 1200 calls are offered to a group of call channel

and 6 are lost. The average call time is 3 minutes. Calculate: [CLO 1]

- i. Traffic Offered (3 marks)
- ii. Traffic carried (3 marks)
- iii. Traffic lost (3 marks)
- iv. Grade of service (GOS) (3 marks)
- v. Total congestion time (3 marks)