

UGC NET - ELECTRONIC SCIENCE

MOCK TEST PAPER

- **PAPER - I** *This paper contains 50 objective type questions. Each question carries 2 marks. Attempt all the questions.*
- **PAPER - II** *This paper contains 50 objective type questions. Each question carries 2 marks. Attempt all the questions.*
- **PAPER - III** *This paper contains 75 objective type questions. Each question carries 2 marks. Attempt all the questions. (According to the NEW PATTERN)*
- *Pattern of questions : MCQs*
- *Total marks (PAPER I & II) : 350*
- *Duration of test : Paper I & II - 2.5 Hours
: Paper III - 2.5 Hours*

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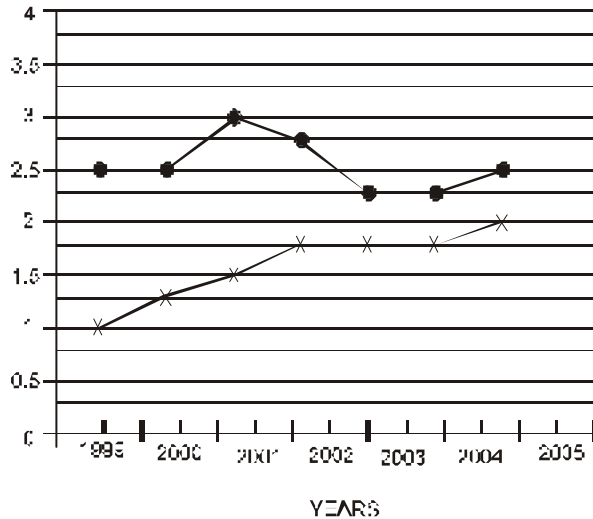
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PAPER – I

1. A manager must discover various analyze the reasons for their occurrence and take preventive steps.
(A) Cause to communication
(B) Barrier to communication
(C) Both (a) and (b)
(D) None
2. "It is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc." which type of communication is this?
(A) Oral communication
(B) Written communication
(C) Non verbal communication
(D) None
3. Which of the following is a part of the English language which helps us to understand sounds of various alphabets?
(A) Phonetics
(B) Homophones
(C) Both (a) and (b)
(D) None

Questions 4-8 Study the following graph carefully to answer the given questions.

PRODUCTION OF TWO COMPANIES A AND B (IN CRORE UNITS) OVER THE GIVEN YEARS



4. For Company A, how much is the percent increase in production in 2000 from 1999?
 (A) 0.25
 (B) 2.5
 (C) 25
 (D) 12.5
5. How many units is the total production of Company A for the given years?
 (A) 9crores
 (B) 17.75 crores
 (C) 12.25 crores
 (D) 11 crores
6. What is the difference in units produced by the two companies in 1999?
 (A) 1,50,000,000
 (B) 15,00,00,000
 (C) 15,00,000
 (D) 15,000
7. How many units is the approximate average production of Company B for the given years?
 (A) 3crores

- (B) 2.55 crores
(C) 2.75 crores
(D) 2.25 crores
8. In which year did both the companies have no change in production from the previous year?
(A) 2000
(B) 2002
(C) 2003
(D) 2004
9. If sampled in reconnaissance mode, data limitation requires use of
(A) Maximum
(B) Minimum
(C) Both (a) and (b)
(D) None
10. If estimating average concentrations is planned
(A) Exposure units must be defined
(B) Sufficient samples are required
(C) Both (a) and (b)
(D) None
11. Which Can be used to evaluate if constituents in subsurface are correlated and have the same or different sources?
(A) Scatter plots
(B) Ratio plots
(C) Multivariate plots
(D) None
12. Which of the following Can be used to evaluate if ratios of constituents in subsurface are similar or different from those in indoor/outdoor air?
(A) Scatter plots
(B) Ratio plots

- (C) Multivariate plots
- (D) None

13. Which of the following collection techniques were used as the primary research methods for this study?
- (A) Qualitative
 - (B) Quantitative
 - (C) Both (a) and (b)
 - (D) None
14. In order to organize, classify and analyze the gathered information, used
- (A) Graphs
 - (B) Statistics
 - (C) Both (a) and (b)
 - (D) None

Direction (15-19) The strength of Indian Democracy lies in its tradition, in the fusion of the ideas of democracy and national independence which was the characteristic of the Indian Nationalist Movement long before independence. Although the British retained supreme authority in India until 1947, the provincial elections of 1937 provided real exercise in democratic practice before national independence. During the Pacific war India was not overrun or seriously invaded by the Japanese and after the war was over, the transfer of power to a government of the Indian Congress Party was a peaceful one as far as Britain was concerned. By 1947 'Indianisation' had already gone far in the Indian Civil Service and Army, so that the new government could start with effective instruments of central control. After independence, however, India was faced with two vast problems; the first, that of economic growth from a very low level of production and the second was that of ethnic diversity and the aspirations of sub nationalities. The Congress leadership was more aware of the former problem than of the second. As a new political elite which had rebelled not only against the British Raj but also against India's old social order, they were conscious of the need to initiate economic development and undertake social reforms, but as nationalists who had led a struggle against the alien rule on behalf of all parts of India,

they took the cohesion of the Indian nation too much for granted and underestimated the centrifugal forces of ethnic division, which were bound to be accentuated rather than diminished as the popular masses were more and more drawn into politics. The Congress party was originally opposed to the idea of recognizing any division of India on a linguistic basis and preferred to retain the old provinces of British India which often cut across linguistic boundaries. However, this was later conceded as the basis for a federal 'Indian Union'. The rights granted to the States created new problems for the Central Government. The idea of making Hindi the national language of a united India was thwarted by the recalcitrance of the speakers of other important Indian languages and the autonomy of the States rendered central economic planning extremely difficult. Land reforms remained under the control of the States and many large-scale economic projects required a degree of cooperation between the Central Government and one or more of the States which, it was found, was impossible to achieve. Coordination of policies was difficult even when the Congress party was in power both in the State and at the Centre. When a Congress Government in Delhi was confronted with non-Congress parties in office in the States, it became much harder.

15. Which of the following problems was India faced with after Independence ?
- (A) Military attack from a country across the border.
 - (B) Lack of coordination between the Central and State Governments.
 - (C) Improper coordination of various Government policies
 - (D) Increasing the production from a very low level
16. Which of the following issues was not appropriately realized by the Central Government.
- (A) Ethnic diversity of the people
 - (B) A national language for the country
 - (C) Implementation of the formulated policies
 - (D) Centre -State relations
17. Why was central economic planning found to be difficult?
- (A) Multiplicity of States and Union Territories

- (B) Lack of coordination in different Government departments
(C) Autonomy given to the States in certain matters
(D) Lack of will in implementing land reforms
18. Why was the linguistic reorganization of the State accepted?
(A) The States were not cooperating with the Central Government
(B) Non- Congress Governments in the States demanded such a reorganization of the States
(C) No common national language emerged
(D) Strong pressure from the States was exerted on the Central Government to create such States
19. Which, according to the passage, can be cited as an exercise in democratic practice in India before Independence?
(A) The handing over of power by the British to India
(B) The Indianisation of the Indian Civil Service
(C) A neutral role played by the Army
(D) None of the above
20. The information to be collected in survey method are related to
(A) Present Position
(B) Aims of the research
(C) The attainment of aim of research
(D) All of the above
21. Research is done for
(A) Knowledge of research process
(B) Solving a business problem
(C) Interest in research
(D) Experience
22. A research problem is feasible only when

- (A) It is researchable
(B) It has some utility
(C) It is new
(D) All of the above
23. One of the essential characteristics of research is
(A) Sensitivity
(B) Generalizability
(C) Usability
(D) Replicability
24. Identify the main Principle on which the Parliamentary System operates.
(A) Responsibility of Executive to Legislature
(B) Supremacy of Parliament
(C) Supremacy of Judiciary
(D) Theory of Separation of power
25. The reservation of seats for women in the Panchayat Raj Institutions is :
(A) 30% of the total seats
(B) 33% of the total seats
(C) 33% of the total population
(D) None
26. Match list I with list II and select the correct from the code given below :
- | List I (Institutions) | List II (Locations) |
|--|---------------------|
| 1. Indian Veterinary Research Institute | i. Pune |
| 2. Institute of Armament Technology | ii. Izat Nagar |
| 3. Indian Institute of Science | iii. Delhi |
| 4. National Institute for Educational Pannesi and Administrators | vi. Bangalore |
- (A) 1-ii, 2-i, 3-iv, 4-ii
(B) 1-ii, 2-iv, 3-ii, 4-iii
(C) 1-ii, 2-iii, 3-i, 4-iv

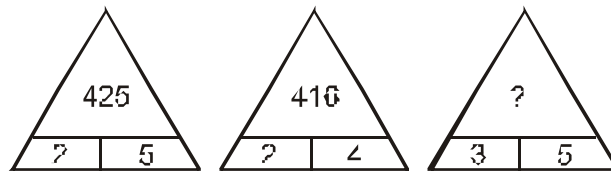
- (D) 1-iv, 2-iii, 3-ii, 4-i
27. Who was chairman of the UGC committee 1969 appointed for administrative legislation of the universities?
- (A). Dr. Zakir Hussain
(B) Dr. P B Gajendragadkar
(C) Dr. L S Mudaliar
(D) Dr. Radha Krishnan
28. UGC has launched career oriented program in
- (A) 1964-65
(B) 1994-95
(C) 1997-98
(D) 1980-81
29. The prime minister of India is appointed from _____
- (A) The leading Party in Lok Sabha
(B) The Leading Party in Rajya Sabha
(C) The leading party in Lok Sabha and Rajya Sabha combined
(D) None of the above
30. The study of interrelations between Organism and their environment is called____
- (A) Biosphere
(B) Ecology
(C) Synecology
(D) Autecology
31. The term ICT is now also used to refer to the convergence of
- (A) Audio visual
(B) Telephone network
(C) Both (a) and (b)

- (D) None
- 32 Which was the first National Park established in India?
- (A) Anshi National Park
(B) Gir National Park
(C) Kanha National Park
(D) Jim Corbett National Park
- 33 Fossil Fuels include
- (A) Oil
(B) Natural Gas
(C) Coal
(D) All of the above
- 34 Noise in excess of _____ is called noise pollution
- (A) 40-65 db
(B) 60-70 db
(C) 80-100 db
(D) None of the above
- 35 Effectiveness of teaching depends on _____
- (A) Handwriting of Teacher
(B) Speaking ability of Teacher
(C) Qualification of the Teacher
(D) Subject Understanding of the Teacher
- 36 Verbal Guidance is least effective in the learning of _____
- (A) Aptitudes
(B) Skills
(C) Attitudes

- (D) Relationship
37. The participation of students will be maximum if _____ method is used for teaching.
- (A) Text Books
 - (B) Discussion Method
 - (C) Conference Method
 - (D) Lectures
38. The primary responsibility of the teacher's adjustment lies with
- (A) The Students
 - (B) The Principal
 - (C) The Community
 - (D) The Teacher himself
39. The First Kindergarten was started by
- (A) William James
 - (B) A D Clinton
 - (C) Freidrich Forebel
 - (D) J H Hills
40. In following questions, number series is given. One of the numbers in each series is wrong. After searching wrong number find the correct number in its place.
- 510, 254, 126, 64, 30, 14, 6
- (A) 252
 - (B) 62
 - (C) 130
 - (D) 9
41. Which reasoning determines whether the truth of a conclusion can be determined for that rule, based solely on the truth of the premises?
- (A) Deductive
 - (B) Inductive
 - (C) Abductive

(D) All

42. Insert the missing number or letter from among the given alternatives.



- (A) 140
(B) 280
(C) 875
(D) 925
43. In the following question assuming the given statements to be true, find out which of the two assumptions I and II given below them is/are definitely true give answer as.

- (A) Only assumption I is implicit
(B) Only assumption II is implicit
(C) Either I or II is implicit
(D) Neither I nor II is implicit
(E) Both I and II are implicit

Statement: The State government has decided to appoint four thousand primary school teachers during the next financial year.

Assumptions:

- I. There are enough schools in the state to accommodate four thousand additional primary school teachers.
II. The eligible candidates may not be interested to apply as the government may not finally appoint such a large number of primary school teachers.

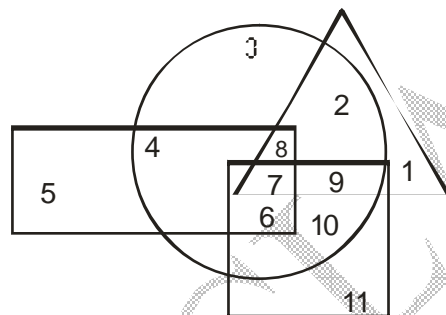
44. What is the latest write-once optical storage media?
(A) Digital paper
(B) Magneto-optical disk
(C) WORM disk

(D) CD-ROM disk

45. Which of the following identifies a specific web page and its computer on the Web?

- (A) Web site
- (B) Web site address
- (C) URL
- (D) Domain Name

Direction (46-47) In the following figure, rectangle, square, circle and triangle represents the regions of wheat gram, maize and rice cultivation respectively. On the basis of the figure, answer the following questions.



46. Which of the area is cultivated for wheat and maize only?

- (A) 8
- (B) 6
- (C) 5
- (D) 4

47. Which of the area is cultivated for maize only?

- (A) 10
- (B) 2
- (C) 3
- (D) 4

48. Pointing to a photograph. Bajpai said, "He is the son of the only daughter of the father of my brother." How Bajpai is related to the man in the photograph?
- (A) Nephew
(B) Brother
(C) Father
(D) Maternal Uncle
49. Light Year is a unit of:
- (A) Intensity of light
(B) Distance
(C) Time
(D) Planetary motion
50. Tsunamis are huge sea waves caused by :
- (A) Earthquakes
(B) Volcanoes
(C) Winds
(D) Icebergs

PAPER- II

1. An earth station receiver consists of
- (A) RF to IF down converter
(B) IF to RF converter
(C) Either (a) & (b)
(D) None of these
2. In counter, each flip flop will toggle when its clock receives a
- (A) Zero edge clock
(B) Negative edge clock

- (C) Positive edge clock
(D) None of these
3. In conductor, Forbidden gap is
- (A) Large
(B) Very large
(C) small
(D) Overlapped
4. The process of reducing quantity of data is
- (A) Data handling capacity
(B) Data reduction
(C) Data processing
(D) Programme
5. The dynamic properties of sample and hold circuit are important in the overall performance of
- (A) ADC
(B) DAC
(C) Signal conversion system
(D) Sample and hold circuit
6. Consider the following interrupt
- i. RST 6.5
ii. RST 7.5
iii. RST 5.5
iv. INTR
- The correct descending order of these interrupts according to priority is
- (A) ii, i, iii, iv
(B) iv, ii, i, iii
(C) iv, iii, i, ii

(D) ii, i, iii, iv

7. Consider the different typical services

i. Government

ii. Word wide telegraphy

iii. Broadcasting

iv. Satellite communication

The correct increasing order of these services according to frequency band used for those is

(A) i, iv, ii, iii

(B) ii, iii, iv, i

(C) iii, ii, i, iv

(D) ii, iv, i, iii

Read the passage below and answer the questions 8 to 12 that follows based on your understanding of the passage

The initial polarization of electromagnetic waves is determined by the orientation of antenna itself in the space. Hence in the design of an antenna, the type of polarization is one of the factor. Different types of polarizations are useful in different types of application.

Besides linear polarization, antenna may also radiate circularly or elliptically polarized waves. In recent years circular polarization has become quite common in VHF and UHF. If two linearly polarization simultaneously produce in the same direction from the same antenna provided that the two linear polarization are mutually perpendicular to each other with a phase difference of 90° , then circularly polarized waves are produced. Circular polarization may be right handed or left handed depending upon the sense of rotation i.e, phase difference is positive or negative. Circular polarization results only when the amplitudes of two linearly polarized waves are equal. If the

amplitudes are not equal, then combination of two linearly polarized waves will produce Elliptically polarized wave.

Further, the undesired radiation from an antenna is called as Cross Polarization. The cross polarization for linearly polarized antennas, is perpendicular to the intended radiation. Antennas are also called as vertically or horizontally polarized antennas and not vertical or horizontal. VLF, LF, MF and some of the HF antennas are made vertically polarized due to the closeness of earth. But there are some advantages also in using horizontally polarized antennas, as man-made noises have usually vertical polarization.

Thus, as seen, polarization from an antenna may be linearly, Elliptically or circularly but polarization in different portion of the total antenna pattern may be different e.g., polarization of major and minor lobes even be different.

Ordinarily simplest antennas transmit or receive linearly polarized waves. However, at VLF it is practically not possible to transmit horizontally polarized waves successfully as it will be cancelled by the radiation from the image antennas in the earth. On the other hand, vertically polarized wave propagate successfully at these frequencies and hence at these frequencies (below 1000 MHz) vertically polarized waves are the only practicable mode.

At television broadcasting frequencies (between 54 to 890 MHz) horizontal polarization has been adopted as standard. In all the microwaves frequencies (above 1000 MHz) there is a little basis for a choice of horizontal and vertical polarization. Final decision, however, is taken according to the type of application. But in any case the polarization should be same in the transmitting and receiving antennas.

8. When the amplitudes of two linearly polarized waves are equal then resulting polarization is
- (A) Linear
 - (B) Circular

- (C) Elliptical
- (D) Cross
9. Man made noises have usually, which of the following polarization
- (A) vertical
- (B) Horizontal
- (C) Not Vertical or horizontal
- (D) May be vertical or horizontal
10. At which frequencies vertically polarized waves are the only practicable mode
- (A) Between 54 to 890 MHz
- (B) Above 1000 MHz
- (C) Below 1000 KHz
- (D) Between 1000 KHz to 1000 MHz
11. In recent years circular polarization has become quite common in
- (A) VHF
- (B) UHF
- (C) Both (A) and (B)
- (D) MF
12. Indicate the False statement
- (A) The undesired radiation from an antenna is called as cross polarization
- (B) The polarization should be same in the transmitting and receiving antenna
- (C) Polarization of electromagnetic wave is determined by the orientation of antenna is say in the space
- (D) All are true

13. Match List-I (Name of the circuit) with List-II (Characteristics) and select the correct answer using the codes given below the lists :

List-I	List-II
A. Tunnel diode oscillator	1. Produces high current pulses of short
B. UJT oscillator	2. An LC oscillator used for generation of sine wave at RF
C. Hartley oscillator	3. A negative resistance oscillator for MW frequency
D. Blocking	4. Uses negative oscillator resistance property for the Generation of sawtooth waveform

Codes :

	A	B	C	D
(A)	3	2	1	4
(B)	1	2	4	3
(C)	3	4	2	1
(D)	4	3	1	2

14. Match the list of GROUP-I with the list of GROUP-II for a JFET-

GROUP-i	GROUP-ii
(A) Pinch-off voltage decrease	(i) If channel doping reduced.
(B) Transconductance increases	(ii) If channel length increased.
(C) Transit time of carriers in channel is reduced	(iii) If channel conductivity increased
	(iv) If channel length reduced.
	(v) If gate area reduced.

(A) A – (i), B – (v), C – (iii)

- (B) A – (i), B – (ii), C – (v)
 (C) A – (i), B – (v), C – (v),
 (D) A – (ii), B – (v), C – (v).

15. Match List I and List II:

List I

- (A) Multiplexer
 (B) De-Multiplexer
 (C) Shift register
 (D) Encoder
 (A) A – 3 B – 4 C – 1 D – 1
 (B) A – 4 B – 3 C – 1 D – 2
 (C) A – 3 B – 4 C – 2 D – 1
 (D) A – 1 B – 2 C – 3 D – 4

List II

- (1) Sequential memory
 (2) Converts decimal number to binary
 (3) Data selector
 (4) Routes out many data output with single input

16. Match List (Modulation system) and List II () Figure of merit

List I	List II
(A) AM-DSB FC	(1) 2
(B) WBEM	(2) 1
(C) PCM	(3) 3mf
(D) AM-DSB	(4) 2

- (A) A – 1 B – 2 C – 3 D – 4
 (B) A – 2 B – 1 C – 4 D – 3
 (C) A – 2 B – 3 C – 4 D – 1
 (D) A – 4 B – 3 C – 2 D – 1

17. Match LIST-I and LIST – II and select the answer using the codes given:

LIST- I (Antennas)

- A. Cass grain antenna
 B. Yagi antenna
 C. Parabolic reflector antenna
 D. Loop antenna

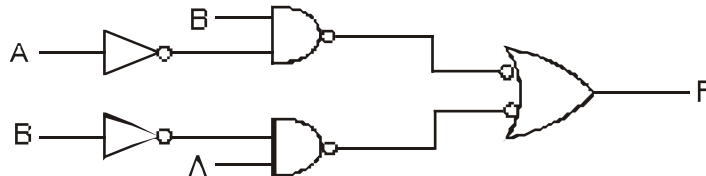
LIST- II (Application)

1. Large Bandwidth
 2. Direction Finding
 3. Radar
 4. Directional transmission

Codes

	A	B	C	D
(A)	1	4	2	3
(B)	3	1	4	2
(C)	2	4	3	1
(D)	3	2	4	1

18. The logic expression for the output of the circuit shown in the figure is



- (A) $f = \bar{A}\bar{B} + AB$
 (B) $f = \bar{A}B + A\bar{B}$
 (C) $f = \bar{A}B$
 (D) $f = A\bar{B}$
19. Which of the given statement is false for serial adder?
 (A) Uses shift Registers
 (B) Equal to the number of bits in the binary numbers
 (C) Sequential circuit
 (D) Consists of a full - adder & flip - flop.
20. Convert $(1110110011111010)_2$ to decimal.
 (A) 66006_{10}
 (B) 60066_{10}
 (C) 60666_{10}
 (D) 66606_{10}
21. Identify the function for the given minimized form.
 $F(A, B, C) = \sum m(0, 3, 5)$
 (A) $F = (\bar{A}\bar{B}\bar{C}) + (\bar{A}BC) + (A\bar{B}C)$
 (B) $F = (ABC) + (A\bar{B}\bar{C}) + (\bar{A}B\bar{C})$
 (C) $F = (\bar{A} + \bar{B} + \bar{C}) + (\bar{A} + B + C) + (A + \bar{B} + C)$
 (D) $F = (A + B + C) \cdot (A + \bar{B} + \bar{C}) \cdot (\bar{A} + B + \bar{C})$
22. What will happen after execution of the following 'C' fragment?

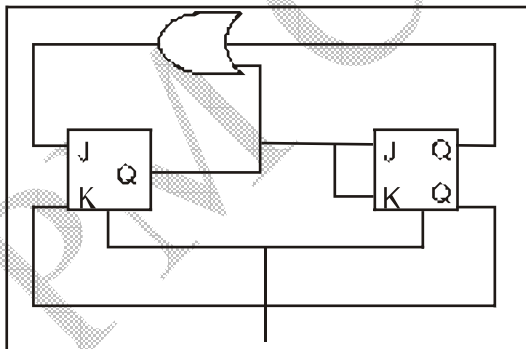
```
{ double d ;
  scanf ( "% C" , d ) ;
```


 (A) Compilation error
 (B) Run time error
 (C) Logical error
 (D) No error.

23. The following loop
while (printf ("%d", printf ("az"))
printf("by:);
(A) prints azbybybyby...
(B) prints azbyazbyazbyazby...
(C) results in a syntax error
(D) None of the above
24. Consider the following program fragment
if (a > b)
 printf ("a < b");
else
 printf ("a <= b");
a <= b will be printed if
(A) a > b
(B) a < b
(C) a = b
(D) All of these
25. The body of the following for loop
for (putchar ('a'); putchar (0); putchar ('c'))
putchar ('b');
will be executed
(A) 0 times
(B) 1 time
(C) Infinitely many times
(D) Will not be executed because of syntax error
26. If storage class is missing in the array definition, by definition, by default it will be taken to be
(A) automatic
(B) external
(C) static
(D) either automatic or external depending on the place of occurrence
27. Consider the following program fragment.
procedure exchange (A: integer, B: integer)
temp : integer;
end;
begin
M := 2; X [M] := 4;
Exchange (M, X[M]); write (M, x[2]);
end
If the parameters are passed by value, the output will be
(A) unpredictable
(B) 2, 4

- (C) 4, 2
(D) 2, 2

28. 4, 2 will be the output of the previous question if the parameters are passed by
(A) Reference
(B) Name
(C) Value
(D) None of the above
29. If the parameters are passed by name, the output will be
(A) 2, 2
(B) 4, 4
(C) 2, 4
(D) 4, 2
30. Choose the correct statement.
(A) Step-wise refinement uses top-down methodology
(B) Step-wise refinement uses bottom-up methodology
(C) Use of library routines facilitate bottom-up methodology
(D) A and C both
31. Which of the following logic families is well suited for high-speed operation?
(A) TTL
(B) ECL
(C) MOS
(D) CMOS
32. The following arrangement of JK flip-flops does the functions of a



- (A) A Shift register
(B) Mod-3 counter
(C) Mod-2 counter
(D) None of the above

33. If many functions have the same name, which of the following information, if present, will be used by the compiler to invoke the correct function to be used?
(A) The operator;
(B) The return value of the function
(C) Function signature
(D) None of the above
34. Choose the correct remarks.
(A) C++ allows any operator to be overloaded
(B) Some of the existing operators cannot be overloaded
(C) Operator precedence cannot be changed.
(D) All of the above.
35. If the function `chg` is coded as

```
int chg (const int ex)
{
    x = 10;
    return (11);
}

```

then
(A) it results in compile-time error
(B) it results in run time error
(C) it prints 112
(D) it prints 1110
36. Barrier potential of a p-n junction diode does not depend on?
(A) doping density
(B) diode design
(C) temperature
(D) Forward bias
37. If an induction type energy meter runs fast, it can be slowed down by adjusting the
(A) lag
(B) Light load
(C) position of braking magnet and making it move closer to the centre of the disc
(D) position of braking magnet and making it move away from the centre of the disc
38. Which one of the following statements is NOT correct?
(A) If everything else is equal, then a 10 bit digital ramp ADC. will have a better resolution but a longer conversion time than an 8 bit ADC
(B) The conversion time for a successive approximation increase with the increase in input voltage
(C) A flash ADC does not contain a DAC
(D) VCO is the main component of a voltage to frequency ADC
39. For a periodic function the spectral density and the autocorrelation functions form
(A) Fourier transforms pair

- (B) Laplace transforms pair
- (C) Hubert's transform pair
- (D) Z-transform pair

40. Match List I with List II and select the correct answer using the codes given below the lists:

- | | |
|-------------------------|-------------------|
| List I | List II |
| A. Collector modulation | 1. FM generation |
| B. Phase shift method | 2. DSB generation |
| C. Balanced modulator | 3. AM generation |
| D. Amplitude limiter | 4. SSB generation |

Codes:

	A	B	C	D
(A)	3	4	1	2
(B)	4	3	1	2
(C)	3	4	2	1
(D)	4	3	2	1

41. With a real-time constraint, the transmission bandwidth needed for a digital signal with r symbols per second is equal to or greater than
- (A) $1/r$
 - (B) $r/2$
 - (C) r
 - (D) $2r$
42. A dc cumulatively compounded motor delivers rated load torque at rated speed, If the series field is short-circuited, then the armature current and speed will
- (A) Both decrease
 - (B) Both increase
 - (C) Increase and decrease respectively
 - (D) Decrease and increase respectively
43. HPA is
- (A) High power audio
 - (B) High port audio
 - (C) High power amplifier
 - (D) None of these
44. The frequency range of 1GHZ to 30GHZ are referred as
- (A) Sound waves

(B) Micro waves

(C) Mini waves

(D) None of these

45. In order to reduce interference, the signal should be

(A) Amplified

(B) Multiplied

(C) Demodulated

(D) Modulated

46. Assertion (A) : The output voltage swing of a difference amplifying can be increased by using a current mirror circuit.

Reason (R) : The current mirror circuit has low static resistance and high dynamic resistance.

Codes:

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is not a correct explanation of A.

(C) A is true but R is False.

(D) A is False but R is true.

47. Assertion A: The part of the root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis

Reason R: Poles and zeros which are not on the real axis always occur in conjugate pairs.

Codes:

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is not a correct explanation of A.

(C) A is true but R is False.

(D) A is False but R is true.

48. A minimum phase system has gain margin of 8 dB and a phase margin of 21° .

Assertion A : The system is stable

Reason R : For a minimum phase system, both phase margin and gain margin must be positive for the system to be stable.

Codes:

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is not a correct explanation of A.

(C) A is true but R is False.

(D) A is False but R is true.

49. Assertion A : Conductors do not permit propagation of waves more than a short distance into the conductor at microwave frequencies
Reason R: The relaxation time constant for conductors is much smaller than the period of centimetric EM wave.
Codes:
(A) Both A and R are true and R is the correct explanation of A
(B) Both A and R are true but R is not a correct explanation of A.
(C) A is true but R is False.
(D) A is False but R is true.
50. Consider the following rectifiers
(i) Half-wave Rectifier
(ii) Full - wave center tap Rectifier
(iii) Full - wave Bridge rectifier
The correct increasing order of these rectifiers according to number of diodes used
(A) i, iii, ii
(B) ii, i, iii
(C) ii, iii, i
(D) i, ii, iii

PAPER – III

1. Point the odd one out:
(A) Sound
(B) Animation
(C) Graphics
(D) WWW
2. Which of the following cannot be classifiable as system software?
(A) Linux
(B) Windows 2000
(C) MS Dos
(D) Oracle
3. Which of these cannot be considered as an element of Multimedia computer
(A) CD ROM
(B) Speakers
(C) Microphone
(D) Network card

4. Which of the following check the syntactic correctness of a source program:
- (A) Interpreter
 - (B) Compiler
 - (C) Interpreter and compiler
 - (D) None of the above
5. High level languages are characterized by:
- (A) English-like statement
 - (B) Translator for machine code
 - (C) Portability of programs
 - (D) All of the above
6. Thermal noise power of a resistor depends upon
- (A) Its resistance value
 - (B) Noise temperature
 - (C) Bandwidth
 - (D) Ambient temperature
7. A JFET operates in
- (A) Depletion mode
 - (B) Enhancement mode
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
8. Consider the following statements relating to a laser beam
1. It is highly monochromatic
 2. Has high angular divergence
 3. It is produced by spontaneous emission
 4. It is used in communication wave
 5. It is an electromagnetic wave
- of these statements
- (A) 1, 4, and 5 are correct
 - (B) 4 and 5 are correct
 - (C) 1, 2 and 3 are correct
 - (D) 2, 3 and 4 are correct
9. Figure of merit is always unity in
- (A) SSB-SC
 - (B) AM
 - (C) FM
 - (D) All of these

10. The choice of the product RC in an envelope detector using a diode and R-C circuit is governed by
(A) Both the lowest and the highest modulation frequencies
(B) Only the depth of modulation
(C) The depth of modulation and the lowest modulation frequency
(D) The depth of modulation and the highest modulation frequency
11. The operation of an inverter fed induction motor can be shifted from motoring to regenerate braking by
(A) Reversing phase sequence
(B) Reducing inverter voltage
(C) Decreasing inverter frequency
(D) Increasing inverter frequency
12. A four quadrant chopper cannot be operated as
(A) One quadrant chopper
(B) Cycloconverter
(C) Inverter
(D) Bi-directional rectifier
13. In a hollow rectangular waveguide, phase velocity is
(A) Increases with increasing in frequency
(B) Decreases with increase in frequency
(C) Independent of frequency
(D) Will vary with frequency in a given range
14. In the equivalent circuit of a transmission line, if we replace the equivalent T network by π network then
(A) Line equations will change
(B) Line equations remain unchanged
(C) Value of propagation constant will change
(D) Value of circuit impedance
15. The Q factor of a microwave resonant cavity is -
1. Proportional to volume of the cavity
2. Proportional to the total inner surface area
3. Proportional to frequency of the wave
4. Inversely proportional to metallic resistance of guide walls
The correct statements are -
(A) 1 and 2 only
(B) 2 and 3 only
(C) 1, 2 and 3

(D) 1, 3 and 4

16. The built in potential in semiconductor is
(A) Dependent to doping
(B) Independent of doping
(C) Partially dependent of doping
(D) None of the above
17. An avalanche photo diode works on
(A) High Forward Bias
(B) High Forward Bias and impact ionization
(C) High Reverse Bias
(D) All of the above
18. TTL circuits with active pull up are preferred because of their stability for
(A) Wired - AND operation
(B) Wired - or operation
(C) Bus operated system
(D) Reasonable dissipation and speed of operation
19. The first machine cycle of an instruction is always
(A) A memory read cycle
(B) A fetch cycle
(C) An I/O read cycle
(D) A memory write cycle
20. Radiation efficiency of an antenna is defined as the ratio of
(A) Total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter
(B) The frequency at which minimum power is radiated to the frequency at which maximum power is radiated
(C) Total power accepted from the transmitter to total power generated by the transmitter
(D) Power in main lobe to that in the side lobe
21. Compared to transistor and FETs the speed of switching in a Schottky diode is
(A) Higher
(B) Lower
(C) Same
(D) Can't say

22. Introducing a resistor in the emitter of a common emitter amplifier stabilizes the d.c operating point against variations in
- (A) Only temperature
 - (B) Only β of transistor
 - (C) Both temperature and β
 - (D) None of these
23. In the design of digital logic families there is a trade off between
- (A) Propagation delay and power dissipation
 - (B) Switching time and fan out
 - (C) Fan out and power dissipation
 - (D) Switching time and noise margin
24. Doping increases which type of charge carriers over their intrinsic values
- (A) Minority carriers
 - (B) Majority carriers
 - (C) Both (A) and (B)
 - (D) None of these
25. The use of non-uniform quantization leads to
- (A) Reduction in transmission bandwidth
 - (B) Increase in maximum SNR
 - (C) Increase in SNR for low level signals
 - (D) Simplification of quantization process
26. A TTL totem-pole circuit is designed so that the output transistors
- (A) Are always on together
 - (B) Provide phase splitting
 - (C) Provide voltage regulation
 - (D) Are never on together
27. To operate correctly, starting of a ring counter requires
- (A) Clearing all the flip-flops
 - (B) Presetting one flip-flop and clearing all the others
 - (C) Clearing one flip-flop and presetting all the others
 - (D) Presetting all the flip-flops
28. $1111+1111=$
- (A) 10111
 - (B) 10110
 - (C) 11111
 - (D) 01111

29. In which of the following function each term is known as min term?
(A) SOP
(B) POS
(C) Hybrid
(D) Both SOP and POS
30. The correct order of precedence from highest to lowest is:
(A) ++ () * + < =
(B) ++ * - > && ==
(C) && < ++ < * !
(D) ++ * + < && =
31. DOS allows division of disk space into different portions called PARTITIONS.
(A) True
(B) False
(C) Sometime true
(D) Can't be said
32. ATTRIB is an internal DOS Command.
(A) True
(B) False
(C) It is not DOS command
(D) It is external DOS command
33. The most commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called
(A) ASCII
(B) EBCDIC
(C) BCD
(D) All of above
34. 'C' is
(A) Machine language
(B) Assembly language
(C) High level language
(D) Natural language

35. For $x = 9$, $y = 5$, $z = 3$ the answer of if $(x > y) \ \&\& \ (y < z)$ statement will be.
(A) True
(B) False
(C) 5
(D) 2
36. Indicate which is not the characteristics of algorithm.
(A) Input
(B) Effectiveness
(C) Infiniteness
(D) None of the above
37. The symbol used to add description comment to the flow chart is
(A) INPUT symbol
(B) START symbol
(C) PROCESSING symbol
(D) ANNOTATION symbol
38. A derived data type is a combination of other already known types.
(A) True
(B) False
(C) Partially true
(D) None of the above
39. A two-dimensional array of character is known as an array of strings
(A) True
(B) False
(C) Sometime true
(D) None of the above
40. Which of the following is basic data type?
(A) Array
(B) Character
(C) Structure
(D) Union
41. $a \ll 1$ is equivalent to
(A) Multiplying a by 2
(B) Dividing a by 2
(C) Adding 2 to a
(D) None of the above
42. Assume an unsigned integer occupies 1 byte. Let $myVar$ be an unsigned integer. Then $myVar \ll 1$ multiplies $myVar$ by 2 if it is not greater than
(A) 127
(B) 255

- (C) 256
- (D) 128

43. In a certain machine, the sum of an integer and its 1's complement is $2^{20} - 1$. Then size of (int), in bits, will be
- (A) 16
 - (B) 32
 - (C) unpredictable
 - (D) None of the above
44. The for loop
- ```
for (i = 0; i < 10; ++i)
 printf ("%d", i & 1);
```
- prints
- (A) 0101010101
  - (B) 0111111111
  - (C) 0000000000
  - (D) 1111111111
45. The declaration
- ```
enum cities(bethlehem, jericho, nazareth = 1, jersualen)
```
- assigns the value 1 to
- (A) Bethlehem
 - (B) Nazareth
 - (C) Bethlehem and nazareth
 - (D) jericho and nazareth
46. A programming methodology used with internet are
- (A) C ++ programming
 - (B) HTML programming
 - (C) GUI programming
 - (D) None of the above
47. Content addressable memory is one in which
- (A) Data is searched directly without giving address
 - (B) Address is given and contents are read
 - (C) Address is applied and contents are stored
 - (D) None of the above
48. Indicate which is not type of digital modulation.
- (A) Phase modulation
 - (B) Pulse code modulation
 - (C) Delta modulation
 - (D) Phase shift modulation

49. 'Video teleconferencing' mean
(A) Sitting together and seeing vide film
(B) A conference organized in TV studio
(C) Seeing the conference on television
(D) Sitting at distance and conferencing with the help of computer network
50. The baud rate.
(A) It always equal to bit transfer rate
(B) Is equal to twice the bandwidth of an ideal channel
(C) Is not equal to signalling rate
(D) Is equal to one half the bandwidth of an ideal channel
51. 'Compiler's is
(A) A device
(B) Software
(C) Communication channel
(D) None of the above
52. A half byte is also called as
(A) Data
(B) Nibble
(C) Half byte
(D) Word
53. The difference between a Television and monitor is
(A) Monitor can not display TV signals
(B) Monitor can not directly display a clear picture
(C) Monitor can not give a steady picture
(D) None of the above
54. A fast access small capacity semiconductor memory is
(A) PROM
(B) RAM
(C) Scratchpad
(D) ROM
55. To enter the zeros in a register is called
(A) Return
(B) Reset
(C) Fill zero
(D) None of the above
56. Isolation in ICs is required.
(A) To make is simpler to test circuits

- (B) To protect the components from mechanical damage
- (C) To protect the transistor from possible "thermal runaway".
- (D) To minimize electrical interaction between circuit components

57. An ON-OFF controller is a
- (A) P controller
 - (B) PID controller
 - (C) Integral controller
 - (D) Non linear controller
58. A stepper motor is
- (A) A dc motor
 - (B) A single-phase ac motor
 - (C) A multi-phase motor
 - (D) A two phase motor
59. Most of the gain and selectivity in a super heterodyne receiver is obtained in the
- (A) RF amplifier
 - (B) Mixer
 - (C) IF amplifier
 - (D) Demodulator
60. The switching speed of a p-n junction depends primarily on
- (A) Mobility of majority carriers in n region
 - (B) Mobility of minority carriers in p region
 - (C) Lifetime of minority carriers in p region
 - (D) Lifetime of minority carriers in n region
61. Modern ac to dc converters employ GTOs instead of SCRs in order to have
- (A) Low reactive volt ampere flow
 - (B) Reliable commutation
 - (C) Low switching loss
 - (D) Smaller heat sink
62. For a single - phase two pulse phase - controlled rectifier, with a freewheeling diode across RL load,
- (A) The instantaneous output voltage v_o is always positive
 - (B) v_o may be positive or zero
 - (C) v_o may be positive, zero or negative
 - (D) v_o is always zero or negative
63. The effect of source inductance on the performance of single - phase and three - phase full converters is to
- (A) Reduce the ripples in the load current

- (B) Make discontinuous current as continuous
(C) Reduce the output voltage
(D) Increase the load voltage.
64. A four quadrant operation requires
(A) Two full converters in series
(B) Two full converters connected back to back
(C) Two full converters connected in parallel
(D) Two - semi converters connected to back
65. In circulating current type of dual converter, the nature of voltage across reactor is
(A) Alternating
(B) Pulsating
(C) Direct
(D) Triangular.
66. The output of a single - phase full - wave rectifier contains
(A) Dc plus even harmonics
(B) Dc plus odd and even harmonics
(C) Dc plus both odd and even harmonics
(D) Dc and no harmonics
67. A time - margin for series inverter ensures
(A) Low power loss
(B) Safety of the device
(C) Improved power factor
(D) Absence of harmonics
68. The output voltage wave form of a 3 - phase square - wave inverter contains
(A) Only even harmonics
(B) Both odd and even harmonics
(C) Only odd harmonics
(D) Only triplan harmonics
69. Integral cycle control
(A) Is very fast in action
(B) Does not introduce sub -harmonics in the supply lines which are different to filter
(C) Cannot be used on inductive loads
(D) Can be advised only for loads with high time constants and limited range control.
70. A cycloconverter is a frequency converter from
1. higher to lower frequency with one - stage conversion
2. higher to lower frequency with two - stage conversion
3. lower to higher frequency with one - stage conversion

4. ac at one frequency to dc and then dc to ac at a different frequency

From these, the correct statements are

- (A) 2, 4
- (B) 1 only
- (C) 2, 3
- (D) 1, 3

71. The cycloconverters (CCs) require natural or forced commutation as under:

- (A) Natural commutation in both step - up and step - down CCs
- (B) Forced commutation in both step - up and step - down CCs
- (C) Forced commutation in the step - up CCs
- (D) Forced commutation in step - down CCs

72. Consider the following statements regarding cycloconverters

- 1. In 1 - phase to 1 - phase CC, firing angle may be varied
- 2. In 3 - phase to 1 - phase CC, firing angle may be kept constant
- 3. In 3 - phase to 1 - phase CC, firing angle may be kept constant
- 4. In 3 - phase to 1 - phase CC, firing angle must be varied

From these, the correct statements are

- (A) 2, 4,
- (B) 1, 3,
- (C) 2, 3
- (D) 2, 3, 4

73. SMPSs are superior to linear power supplies in respect of

- (A) Size and efficiency
- (B) Efficiency and regulation
- (C) Regulation and noise
- (D) Noise and cost.

74. Bulk power transmission over HVDC lines are preferred on account of

- (A) Low cost of HVDC terminals
- (B) No harmonic problems
- (C) Minimum line power
- (D) Simple protection

75. The most accurate and versatile method of achieving reactive power compensation is by using.

- (A) Switched capacitors
- (B) Fixed capacitor with controlled reactor
- (C) Saturable reactor with capacitor bank
- (D) Saturable reactor with controlled reactor

ANSWER KEY

PAPER-I

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	B	C	A	C	D	A	B	D	A	C	A	B	A	C	D	A	C	D	B	D
Question	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Answer	B	D	C	A	D	A	B	B	A	B	C	D	D	C	D	D	B	D	C	B
Question	41	42	43	44	45	46	47	48	49	50										
Answer	A	D	A	D	D	D	C	D	B	A										

PAPER - II

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	A	B	D	B	A	C	B	B	A	C	C	D	C	C	B	C	C	B	B	C
Question	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Answer	D	B	D	D	A	D	B	A	B	D	B	B	B	D	C	B	A	B	A	C
Question	41	42	43	44	45	46	47	48	49	50										
Answer	D	B	C	B	D	C	A	A	B	D										

PAPER - III

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	D	D	D	B	A	B	A	A	A	C	C	B	B	B	D	A	C	D	B	A
Question	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Answer	B	C	C	B	C	C	B	B	A	D	A	D	A	C	A	C	D	A	A	B
Question	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	D	A	D	A	D	B	A	B	D	A	B	B	A	A	B	D	D	D	C	D
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75					
Answer	B	B	C	C	A	A	B	C	D	D	C	B	A	C	B					

HINTS AND SOLUTIONS

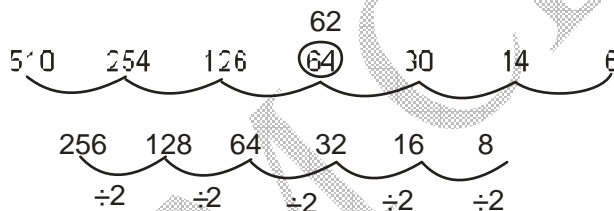
PAPER – I

1. (B) An effective and efficient communication system requires managerial proficiency in delivering and receiving messages. A manager must discover various barriers to communication, analyze the reasons for their occurrence and take preventive steps to avoid those barriers. Thus, the primary responsibility of a manager is to develop and maintain an effective communication system in the organization.
2. (C) non verbal communication is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc.
3. (A) Phonetics is a part of the English language which helps us to understand sounds of various alphabets. How an alphabet should sound is taught to us with the help of Phonetics.
- 4.(C) % increase = $\frac{0.25\text{crore}}{1\text{ crore}} \times 100$
= 25 %
- 5.(D) for company A
 $1 + 1.25 + 1.5 + 1.75 + 1.75 + 1.75 + 2$
= 11 crore
- 6.(A) $(2.5 - 1)$ crores = $1.5 \times 100,00,000$
= 150,00,000
- 7.(B) Total production of B
= $2.5 + 2.5 + 3 + 2.75 + 2.25 + 2.25 + 2.5$
= 17.75
Average production = $\frac{17.75}{7} = 2.55$
- 8.(D) In year 2004.

- 9.(A)** If sampled in reconnaissance mode, data limitation requires use of maximums. Results are screening level- not definitive.
- 10.(C)** If estimating average concentrations is planned
Exposure units must be defined Must be considered in developing DQOs for project, or results may not be accepted.
Sufficient samples are required 8-10 samples when contaminant concentrations vary within a narrow range 10-15 sample when concentrations are less predictable
Calculate 90th Upper Confidence Limit (UCL)
- 11.(A)** Scatter plots Can be used to evaluate if constituents in subsurface are correlated and have the same or different sources.
- 12.(B)** Ratio plots Can be used to evaluate if ratios of constituents in subsurface are similar or different from those in indoor/outdoor air, potentially informing decisions about confounding ambient sources.
- 13.(A)** Qualitative data collection techniques were used as the primary research methods for this study. Participant and direct observation plus note taking were the most important techniques used.
- 14.(C)** qualitative data collection techniques were used as primary research methods. However in order to organize, classify and analyze the gathered information, we used graphs and statistics as a way to measure the students' level of improvement through the use of reading strategies
- 15.(D)** Production was at very low level.
- 16.(A)** Ethnic diversity of the people was not appropriately realized by the Central Government.
- 17.(C)** Central economic planning found to be difficult because autonomy was given to the States in certain matters
- 18.(D)** Because that time no common language emerged.

- 19.(B)** "The Indianisation of the Indian Civil Service" , can be cited as an exercise in democratic practice in India before Independence
- 20.(D)** The information to be collected in survey method are related to present position, aims of the research & the attainment of aim of research
- 21. (B)** Research is done for solving a business problem
- 22. (D)** A research problem is feasible only when it is researchable, it has some utility, and it is new .
- 23. (C)** One of the essential characteristics of research is usability.
- 24.(A)** A parliamentary system is a system of democratic government in which the ministers of the Executive Branch derive their legitimacy from and are accountable to a Legislature or parliament; the Executive and Legislative branches are interconnected. It is a political system in which the supreme power lies in a body of citizens who can elect people to represent them.
- 25.(D)** The Cabinet approved the proposal for enhancing reservation for women in Panchayats on from the present 33 per cent to 50 per cent with the provision being applicable to all seats filled through direct election, office of chairpersons and of offices reserved for SC/ST.
- 26.(A)** IVRI is situated in Izat Nagar.
IAT is situated in Pune
IISc is situated in Bangalore
NIEPA is situated in Delhi.
- 27.(B)** Dr. P B Gajendragadkar was chairman of the UGC committee 1969 appointed for administrative legislation of the universities.
- 28.(B)** UGC has launched career oriented program in 1994-95.
- 29.(A)** The prime minister of India is appointed from the leading Party in Lok Sabha.
- 30.(B)** The study of interrelations between Organism and their environment is called ecology.

- 31.(C) The term ICT is now also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system.
- 32.(D) Jim Corbett National Park was the first National Park established in India.
- 33.(D) Fossil fuels are fuels made by natural processes such as anaerobic decomposition of buried dead organisms.
Ex. Oil, Natural gas, coal etc.
- 34.(C) Noise in excess of 80-100DB is called noise pollution.
- 35.(D) Effectiveness of teaching depends on Subject Understanding of the Teacher
- 36.(D) Verbal Guidance is least effective in the learning of Relationship.
37. (B) The participation of students will be maximum if Discussion Method is used for teaching.
- 38.(D) The primary responsibility of the teacher's adjustment lies with The Teacher himself
- 39.(C) The First Kindergarten was started by Freidrich Forebel
- 40.(B)



30, 64 is wrong & must be replaced by 62.

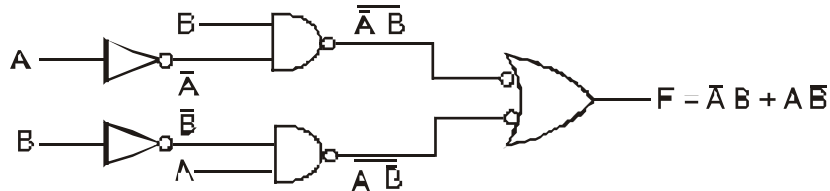
- 41.(A) Deductive reasoning determines whether the truth of a conclusion can be determined for that rule, based solely on the truth of the premises.
- 42.(D) $(2)^2 = 4$, $(5)^2 = 25 \Rightarrow 425$
 $(2)^2 = 4$, $(4)^2 = 16 \Rightarrow 416$
 $(3)^2 = 9$, $(5)^2 = 25 \Rightarrow 925$.

43. (A) Such decisions as given in the statement are taken only after taking the existing vacancies into consideration. So, I implicit while II does not implicit.
44. (D) CD-ROM disk is the latest write-once optical storage media
45. (D) Domain Name identifies a specific web page and its computer on the Web.
46. (D) The required region is the one which is common only to the rectangle and circle and is not a part of either the triangle or square
47. (C) The required region is the one which lies inside the circle but outside the rectangle, square and triangle,
48. (D) The man in the photo is the son of the sister of Bajpai. Hence, Bajpai is the maternal uncle of the man in the photograph.
49. (B) Light Year is a unit of distance.
50. (A) Tsunamis are huge sea waves caused by earthquakes.

PAPER- II

1. (A) An earth station receiver consists of RF to IF down converter.
2. (B) In counter, each flip flop will toggle when its clock receives a negative edge clock.
3. (D) In conductor, Forbidden gap is overlapped.
4. (B) The process of reducing quantity of data is Data reduction.
5. (A) The dynamic properties of sample and hold circuit are important in the overall performance of ADC.
6. (C)
- | | |
|------------|---------------------------|
| Interrupts | Priority |
| TRAP | 1 st (highest) |
| RST 7.5 | 2 nd |
| RST 6.5 | 3 rd |
| RST 5.5 | 4 th |
| INTR | 5 th (Lowest). |

- 7.(B)** Band Typical services
 VLF (3 – 30 KHz) word wide telegraphy
 MF (300 – 3000 KNz) Broadcasting
 SHF (3000 – 30, 000 MHz) Satellite communication
 EHF (30, 000 – 300,000 MHz) Government
- 8.(B)** Circular polarization results only when the amplitudes of two linearly polarized waves are equal
- 9.(A)** Man - made noises have usually vertical polarization.
- 10.(C)** Below 1000 KHz, vertically polarized waves are the only practicable mode.
- 11.(C)** In recent years circular polarization has become quite common in VHF and UHF.
- 12.(D)** All the above statements related to polarization are TRUE.
- 13.(C)** (A) Tunnel diode oscillator → A negative resistance oscillator for mw frequency
 (B) UJT oscillator → Uses negative oscillator resistance property for the generation of sawtooth waveform.
 (C) Hartley oscillator → An LC oscillator used for generation of sinewave at RF.
 (D) Blocking → Produces high current pulses of short
- 14.(C)** In a JFET.
 (A) Pinch - off voltage decreases if channel doping reduced.
 (B) Transconductance increases if channel length reduced.
 (C) Transit time of carriers in channel is reduced if gate area reduced.
- 15.(B)** (A) Multiplexer → Routes out many data output with single input
 (B) De-Multiplexer → Data selector
 (C) Shift register → Sequential memory
 (D) Encoder → Converts decimal number to binary.
- 16.(C)** AM – DSBFC → 1
 WBFM → 3mf
 PCM → 22N
 AM – DSB → 2.
- 17.(C)** Cassgrain antenna → Radar.
 Yagi antenna → Large Bandwidth
 Parabolic reflector antenna → Directional transmission
 Loop antenna → Direction Finding



18.(B)

19.(B) Serial adder requires only one full adder circuit and a carry flip-flop to store the output carry. While parallel adder is equal to the number of bits in the binary numbers.

20.(C) $1110, 1100, 1111, 1010_2 = (ECFA)_{16}$
 $(ECFA)_{16} = (14 * 16^3) + (12 * 16^2) + (15 * 16^1) + (10 * 16^0)$
 $= 57344 + 3072 + 240 + 10$
 $= 60666_{10}$

		BC			
A		00	01	11	10
	0	0		1	
	1		0		

21.(D)

$$F(A, B, C) = (A + B + C)(A + \bar{B} + \bar{C})(\bar{A} + B + \bar{C})$$

PDS form of function.

22.(B) The code / fragment given is syntactically correct but will give a Run-time error as the data type is not matched with respect to the given format specifier. i.e. the given format specifier is for character data type not double.

23.(D) printf("az") prints az and returns a value 2 (since it printed two characters). So, the condition results in the printing of az2. Since it always returns 2, it is an infinite loop. The output will be az2byaz2by...

24.(D) The else clause has no brackets i.e., {and}. This means the else clause is made up of only one statement. So, printf("a < b"); will be executed anyway, i.e. if a > b or a <= b. Hence the answer is (D)

25.(A) The condition is putchar(0). This returns a value - which is a false condition. So, the loop will not be executed even once.

26.(D) If it is coming with in a function, the storage class will be taken to be automatic, otherwise external.

27.(B) In the parameters which are passed by value, the function will be manipulating a local copy of the argument value. Any change will be local to the function and hence will not be reflect in the calling environment. Thus the output will be 2,4

- 28.(A) In call by reference, the address of the actual arguments will be passed to the function. Any change done environment.
- 29.(B) In this case, the following statements will be executed by the function temp; M; M := X[M]; X[X] := temp; So, what is evaluated is temp := 2; M := X[2]; X[M] := temp; i.e., M will be assigned 4, after which X[M], i.e., X[4] will be assigned 2. X[2] remains unaltered. So 4, 4 will be printed.
- 30.(D) The correct statements are
 1 Step-wise refinement uses top-down methodology
 2 The use of library routines facilitate bottom-up methodology
- 31.(B) ECL is well suited for high-speed operation.
- 32.(B) The given arrangement of JK flip-flops does the functions of a Mod-3 counter.
- 33 (B) The return value of the function will be used by the compiler to invoke the correct function.
- 34 (D) All statements are correct.
- 35 (C) Function chg prints 112.
- 36.(B) Barrier potential of a p-n junction diode does not depend on diode design.
- 37.(A) If an induction type energy meter runs fast, it can be slowed down by adjusting the lag.
- 38.(B) The conversion time for a successive approximation increase with the increase in input voltage statement is not the correct.
- 39.(A) For a periodic function the spectral density and the autocorrelation functions form Fourier transforms pair.
- 40.(C) A. Collector modulation - AM generation
 B. Phase shift method - SSB generation
 C. Balanced modulator - DSB generation
 D. Amplitude limiter - FM generation
- 41.(D) With a real-time constraint, the transmission bandwidth needed for a digital signal with r symbols per second is equal to or greater than 2r.
- 42.(B) A dc cumulatively compounded motor delivers rated load torque at rated speed, If the series field is short-circuited, then the armature current and speed will increase.
- 43.(C) HPA is high power amplifier.
- 44.(B) The frequency range of 1GHz to 30GHz are referred as micro waves
- 45.(D) In order to reduce interference, the signal should be modulated.
- 46.(C) The output voltage swing of a difference amplifier can be increased by using a correct mirror circuit is TRUE but the given Reason (R) is False.

- 47.(A) The part of the root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis because poles and zeros which are not on the real axis always occur in conjugate pairs.
- 48.(A) For a minimum phase system, both phase margin and gain margin must be positive for the system to be stable. So the system is stable.
- 49.(B) Depth of penetration = $\delta = \sqrt{\frac{2}{\omega\mu\sigma}}$, where $\sigma = \frac{ne^2\tau}{m}$ $t =$ relaxation time
 δ would be small, if σ is large, which itself depends upon relaxation time.
 t for conductors is of the order of 10^{-14} s, for $l = 3 \times 10^{-2}$ cm
 \therefore Period of centimetric EM waves = $\frac{\lambda}{V_0} = \frac{3 \times 10^{-2}}{3 \times 10^8} = 10^{-10}$ sec
 Therefore, even though t is much smaller than period of centimetric waves but it is not the correct reason for the assertion given.
- 50.(D) Rectifiers
- | | Number of diodes used |
|--------------------------|-----------------------|
| i. Half-wave | 1 |
| ii. Full-wave centre tap | 2 |
| iii. Full-wave bridge | |

PAPER-III

- 1.(D) WWW
- 2.(D) Orade cannot be classifiable as system software
- 3.(D) Network card cannot be considered as an element of Multimedia computer
- 4.(B) Compiler check the syntactic correctness of a source program.
- 5.(A) English-like statement
- 6.(B) Thermal noise power of a resistor depends upon noise temperature.
- 7.(A) A JFET operates in depletion mode.
- 8.(A) A laser beam is
- highly monochromatic
 - used in communication wave

iii. An electromagnetic wave.

- 9.(A) Figure of merit is always unity in SSB-SC.
- 10.(C) The choice of the product RC in an envelope detector using a diode and an R-C circuit is governed by the depth of modulation and the lowest modulation frequency.
- 11.(C) The operation of an inverter fed induction motor can be shifted from motoring to regenerate braking by decreasing inverter frequency.
- 12.(B) A four quadrant chopper can not be operated as cycloconverter.
- 13.(B) In a hollow rectangular waveguide, phase velocity decreases with increase in frequency.
- 14.(B) In the equivalent circuit of a transmission line, if we replace the equivalent T network by π network then line equations remain unchanged.
- 15.(D) The Q-factor of a microwave resonant cavity is
- Proportional to volume of the cavity
 - Proportional to frequency of the wave
 - Inversely proportional to metallic resistance of guide walls.
- 16.(A) The built in potential in semiconductor is dependent to doping.
- 17.(C) An avalanche photo diode works on High Reverse Bias.
- 18.(D) TTL circuits with active pull up are preferred because of their stability for reasonable dissipation and speed of operation.
- 19.(B) The first machine cycle of an instruction is always a Fetch cycle.
- 20.(A) Radiation efficiency of an antenna is defined as the ratio of total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter.
- 21.(B) Compared to transistor and FETS the speed of switching in a Schottky diode is lower.
- 22.(C) Introducing a resistor in the emitter of a common emitter amplifier stabilizes the d.c operating point against variations in both temperature and β .
- 23.(C) In the design of digital logic families there is a trade off between fan out and power dissipation.
- 24.(B) Doping increases - majority carriers and decreases minority carriers over their intrinsic values.
- 25.(C) The use of non-uniform quantization leads to increase in SNR for low level signals.
- 26.(C) A TTL totem - pole circuit is designed so that the output transistors provide voltage regulation.
- 27.(B) On a Ring counter, initially the first flip - flop is preset to 1. so the initial state is 1000.

28.(B) 1 1 1 1 → carry bits
 1 1 1 1
 1 1 1 1 1
 1 0 1 1 1 0

29.(A) In SOP boolean function , each term is known as minterm that is each term is in ANDed form.

30.(D) Correct order of precedence from higher to lowest is:-

++
 *
 +)
 <
 &&
 =

31.(A) Yes it is true that DOS allows division of disk space into different portions called partitions

32.(D) ATTRIB is an external DOS Command.

33.(A) The most commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called ASCII

34.(C) C is a High level language

35.(A) For $x = 9$, $y = 5$, $z = 3$, the given statement $\text{if } (x > y) \&\& (y > z)$ will be true

36.(C) Infiniteness is not the characteristics of algorithm.

37.(D) The symbol used to add description comment to the flow chart is ANNOTATION symbol.

38.(A) Yes it is true that a derived data type is a combination of other already known types.

39.(A) Yes it is true that a two-dimensional array of character is known as any array of strings.

40.(B) Character is a basic data type.

41.(D) The left shift operator \ll , pushes out the most significant (left-most) bit. If it happens to be a 1, a \ll 1, will not be same as multiplying a by 2.

- 42.(A) If the most significant bit is to be zero, the maximum number that can be stored in 7 bits is 127.
- 43.(D) The sum (or bit-wise OR) of a number and its 1's complement will be all 1's. How many 1's depends on how many bits are needed to represent the number. If the sum is $2^{20} - 1$, then the size of (int) in bits must be 20.
- 44.(A) The binary representation of odd numbers will have a 1 as the least significant digit. So, an odd number ANDed with 1, produces a 1, Even number end with 0. So, an even number ANDed with 1, produces a 0. This for loop generates even and odd numbers alternatively. So, it prints alternate 0's and 1's.
- 45.(D) The listed places will be assigned the values 0, 1, 1, 2 respectively.
- 46.(B) A programming methodology used with internet is) HTML programming
- 47.(A) Content addressable memory is one in which data is searched directly without giving address
- 48.(B) Pulse code modulation is not the type of digital modulation.
- 49.(D) 'Video teleconferencing' means sitting at distance and conferencing with the help of computer Network
- 50 (A) The baud rate is always equal to bit transfer rate.
- 51.(B) Software
- 52.(B) Nibble
- 53.(A) Monitor can not display TV signals
- 54.(A) PROM
- 55.(B) Reset
- 56.(D) To minimize electrical interaction between circuit components, isolation in ICs is required.
- 57.(D) An ON-OFF controller is a non linear controller.
- 58.(D) A stepper motor is a two phase motor.
- 59.(C) Most of the gain and selectivity in a super heterodyne receiver is obtained in the IF amplifier.
- 60.(D) The switching speed of a p-n junction depends primarily on life time of minority carriers in n-region.
- 61 (B) Modern ac to dc converters employ GT Os instead of SCRs in order to have reliable commutation.

- 62 (B) For a single - phase two pulse phase - controlled rectifier, with a freewheeling diode across RL load, v_o may be positive or zero.
- 63 (C) The effect of source inductance on the performance of single - phase and three - phase full converters is to reduce the output voltage.
- 64 (C) A four quadrant operation requires two full converters connected in parallel.
- 65 (A) In circulating current type of dual converter, the nature of voltage across reactor is alternating.
- 66 (A) The output of a single - phase full - wave rectifier contains Dc plus even harmonics
- 67 (B) A time - margin for series inverter ensures safety of the device.
- 68 (C) The output voltage wave form of a 3 - phase square - wave inverter contains only odd harmonics.
- 69 (D) integral cycles control can be advised only for loads with high time constants and limited range control.
- 70 (D) A cycloconverter is a frequency converter from-
- (i). higher to lower frequency with one - stage conversion
 - (ii). lower to higher frequency with one - stage conversion
- 71 (C) The cycloconverters (CCs) require natural or forced commutation as under forced commutation in the step - up CCs
- 72 (B) Regarding cycloconverters -
- (i). In 1 - phase to 1 - phase CC, firing angle may be varied
 - (ii). In 3 - phase to 1 - phase CC, firing angle may be kept constant
- 73.(A) SMPSs are superior to linear power supplies in respect of size and efficiency.
- 74 (C) Bulk power transmissions over HVDC lines are preferred on account of minimum line power.
- 75 (B) The most accurate and versatile method of achieving reactive power compensation is by using fixed capacitor with controlled reactor