

Test Booklet No.

प्रश्नपत्रिका क्र.

F

Paper-II

ELECTRONIC SCIENCE

Signature and Name of Invigilator

1. (Signature)

(Name)

2. (Signature)

(Name)

Seat No.

(In figures as in Admit Card)

Seat No.

(In words)

OMR Sheet No.

(To be filled by the Candidate)

AUG - 38215

Time Allowed : 1¼ Hours]

[Maximum Marks : 100

Number of Pages in this Booklet : 16

Number of Questions in this Booklet : 50

Instructions for the Candidates

- Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
- This paper consists of **50** objective type questions. Each question will carry *two* marks. *All* questions of Paper-II will be compulsory, covering entire syllabus (including all electives, without options).
- At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
 - To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal or open booklet.
 - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to missing pages/questions or questions repeated or not in serial order or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.**
 - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- Each question has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
Example : where (C) is the correct response.

(A)	(B)	(C)	(D)
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- Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done at the end of this booklet.
- If you write your Name, Seat Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.
- You have to return original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry the Test Booklet and duplicate copy of OMR Sheet on conclusion of examination.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table, etc., is prohibited.**
- There is no negative marking for incorrect answers.**

विद्यार्थ्यांसाठी महत्वाच्या सूचना

- परिक्षार्थीनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- सदर प्रश्नपत्रिकेत **50** बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे. सदरचे प्रश्न हे या विषयाच्या संपूर्ण अभ्यासक्रमावर आधारित आहेत.
- परीक्षा सुरु झाल्यावर विद्यार्थ्यांला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
 - प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
 - पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चुकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळही वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
 - वरीलप्रमाणे सर्व पडताळून पहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
- प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळ/निळ्या करावा.
उदा. : जर (C) हे योग्य उत्तर असेल तर.

(A)	(B)	(C)	(D)
-----	-----	-----	-----
- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत**. इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
- आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
- प्रश्नपत्रिकेच्या शेवटी जोडलेल्या को-या पानावरच कच्चे काम करावे.
- जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणा व्यतिरीक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटले अशी कोणतीही खूप केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमागाचा अवलंब केल्यास विद्यार्थ्यांला परीक्षेस अपात्र ठरविण्यात येईल.
- परीक्षा संपल्यानंतर विद्यार्थ्यांनी मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापी, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
- फक्त निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.**
- कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

AUG - 38215/II

Electronic Science
Paper II

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Note : This Paper contains **Fifty (50)** multiple choice questions. Each question carries **Two (2)** marks. Attempt *All* questions.

1. If the pn -junction is abrupt, the capacitance varies as :

- (A) Square root of reverse bias
- (B) Cube root of reverse bias
- (C) Square root reverse current
- (D) Square of reverse bias

2. Which of the following diode is referred as hot carrier diode ?

- (A) Schottky
- (B) Step recovery
- (C) Varactor
- (D) Zener

3. The biasing circuit which gives most stable operating point is :

- (A) base bias
- (B) collector to base bias
- (C) voltage divider bias
- (D) emitter feedback bias

4. FET is used as a buffer in measuring instruments, receivers since it has :

- (A) high input impedance and low output impedance
- (B) high input impedance and high output impedance
- (C) low input impedance and low output impedance
- (D) low input impedance and high output impedance

- | | |
|--|--|
| <p>5. Tunnel diode exhibits :</p> <p>(A) Linear resistor</p> <p>(B) Current dependent resistor</p> <p>(C) Voltage dependent resistor</p> <p>(D) Non-linear resistor</p> | <p>7. The Fourier transform of a delta function is :</p> <p>(A) infinite flat band</p> <p>(B) a delta function</p> <p>(C) a finite width Gaussian</p> <p>(D) a large band with notch</p> |
| <p>6. According to the Thevenin's theorem any two terminal linear network can be replaced by a generator equal to the open circuit voltage between the terminals in series :</p> <p>(A) with the input impedance</p> <p>(B) with parallel combination of input and output impedance</p> <p>(C) with output impedance as seen at this port</p> <p>(D) with shorted output</p> | <p>8. A pole on the +ve imaginary axis inside ROC of the S-plot represents :</p> <p>(A) decaying amplitude without oscillations</p> <p>(B) increasing amplitude without oscillations</p> <p>(C) constant oscillation amplitude</p> <p>(D) increasing amplitude with oscillations</p> |

9. When two 2 port networks are connected in parallel it is convenient to use :

- (A) open circuit impedance parameters
- (B) short circuit impedance parameters
- (C) transmission parameters
- (D) inverse hybrid parameters

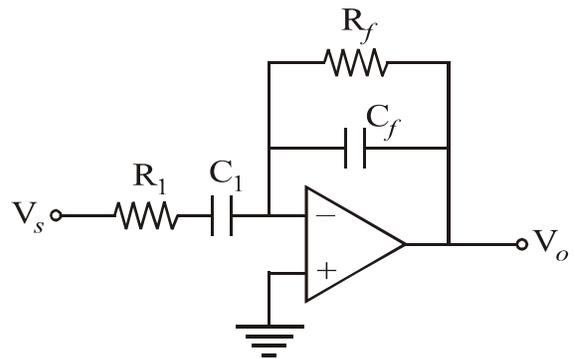
10. In a bandpass filter the shunt element is :

- (A) capacitive
- (B) inductive
- (C) series combination of L & C
- (D) shunt combination of L & C

11. IC 7815 is capable of outputting :

- (A) +15 volts/1 A at full load
- (B) -15 volts/1 A at full load
- (C) ± 15 volts/1 A at full load
- (D) +12 volts/1 A at full load

12. In the practical differentiation circuit shown :



- (A) C_1 cuts off high frequency noise
- (B) R_1 cuts off low frequency noise
- (C) R_1, C_f form the basic differentiation elements
- (D) C_f ensures stable operation

13. The Barkhausen criterion for getting sustained oscillations is $A\beta$:
- (A) = Unity
 - (B) \geq Unity
 - (C) $<$ Unity
 - (D) = Zero
14. Colpitts and Hartley oscillators belong to a general class of oscillators that use feedback.
- (A) Voltage shunt
 - (B) Current series
 - (C) Voltage series
 - (D) Current shunt
15. The frequency of the output of Bistable multivibrator is :
- (A) twice the input frequency
 - (B) thrice the input frequency
 - (C) half the input frequency
 - (D) equal to the input frequency
16. The minimum number of flip-flops required to construct a mod-75 counter is :
- (A) 5
 - (B) 6
 - (C) 7
 - (D) 8

17. The following Boolean expression

$$(ABC + A\bar{B} + AB\bar{C} + \bar{A})$$

can be simplified to :

- (A) B
- (B) C
- (C) \bar{A}
- (D) 1

18. Schottky TTL gate modifies the

following performance :

- (A) Power handling capacity
- (B) Reduce input capacitance
- (C) Reduce saturation charges
- (D) Packing density

19. Gate ECL has the following disadvantage :

- (A) High power dissipation
- (B) Low speed of operation
- (C) Low noise margin
- (D) High voltage supply required

20. Simplification of $AB + \bar{A}B + A\bar{B}$ will lead to :

- (A) A
- (B) $A + B$
- (C) $A + \bar{B}$
- (D) $\bar{A} + B$

21. Which of the following status signals is most important in handling external memory of 8051 ?

- (A) IO/\bar{M}
- (B) ALE
- (C) EA
- (D) RESET

22. For interfacing a seven segment display and a matrix keyboard to a 8085 microprocessor/8051 microcontroller which of the following peripheral chip is generally used ?

- (A) 8155
- (B) 8253
- (C) 8259
- (D) 8279

23. On chip code memory in case of microcontrollers with ISP support is generally :

- (A) EPROM
- (B) SRAM
- (C) EEPROM
- (D) DRAM

24. Identify the instruction among the following, which supports register indirect addressing ?

- (A) ADD A
- (B) MVI A, 2356H
- (C) AND A, M
- (D) XRA A

25. 8085, 8051 and 8086 have,, wide data bus respectively.

- (A) 8, 16, 16
- (B) 16, 8, 8
- (C) 8, 8, 8
- (D) 8, 8, 16

26. While opening a file the filename string is assigned to a :

- (A) Integer
- (B) File pointer
- (C) Function
- (D) Structure

27. Which of the following header file must be included for drawing an electronic circuit diagram using C program ?

- (A) stdio.h
- (B) graphics.h
- (C) video.h
- (D) math.h

28. How many times the following C program loop will be executed ?

```
# include<stdio.h>
```

```
int main( )
```

```
{
```

```
int i = 0;
```

```
for( ; ; )
```

```
printf(“%d”, i);
```

```
return 0
```

```
}
```

- (A) infinite times
- (B) 0 time
- (C) 1 time
- (D) 10 times

29. What will be output of the following C program ?

```
# include<stdio.h>

# include<conio.h>

void main( )

{

    enum cc{Black, Brown, Red,

            Orange,    Yellow,

            Green, Blue, Violet,

            Gray, White};

    clrscr( );

    printf(“%d”, Green);

    getch( );

}
```

- (A) 4
- (B) Yellow
- (C) 5
- (D) Green

30. In C++, a declaration the program.

- (A) must appear at the beginning of
- (B) must appear at the end of
- (C) must appear before # include directive within
- (D) may appear anywhere within

31. A transmission line with $Z_0 = 100 \Omega$ is to be terminated in a load of $Z_1 = 900 \Omega$. The matching $\lambda/4$ transformer must have characteristic impedance of :

- (A) 100Ω
- (B) 900Ω
- (C) 147Ω
- (D) 300Ω

32. The electromagnetic wave in free space is of the type :
- (A) TM
 - (B) TE
 - (C) TEM
 - (D) Longitudinal
33. In a directional coupler, ideally, the power coupled in the backward direction should be :
- (A) 0
 - (B) ∞
 - (C) Same as that at the input
 - (D) 1
34. In transmission line problems, matching means simply terminating the line in impedance.
- (A) highest possible short circuit
 - (B) highest possible open circuit
 - (C) its characteristic
 - (D) short circuit
35. The reflex klystron is a form of klystron oscillator :
- (A) that requires two resonant cavities
 - (B) that is essentially a high-power device
 - (C) where there is no bunching of electrons
 - (D) that requires only a single resonant cavity
36. 3 db points on the frequency response curve of a voltage amplifier are the ones at which voltage gain reduces to :
- (A) unity
 - (B) zero
 - (C) $1/\sqrt{2}$ of its middle frequency value
 - (D) 1/2 of its middle frequency value

37. In a superheterodyne radio receiver :
- (A) the local oscillator frequency is made higher than the incoming signal frequency
 - (B) the local oscillator frequency is made lower than the incoming signal frequency
 - (C) the local oscillator frequency is made equal to the incoming signal frequency
 - (D) the local oscillator frequency can be higher or lower than the incoming signal frequency
38. A digital transmission has an error probability of 1×10^{-5} and is 1×10^8 bits long. Its expected number of error bits is :
- (A) 1×10^3
 - (B) 1×10^5
 - (C) 1×10^4
 - (D) 1×10^8
39. What is the primary function of multiplexing ?
- (A) to reduce the bandwidth of a signal
 - (B) to allow a number of signals to make use of a single communications channel
 - (C) to match the frequency range of a signal to a particular channel
 - (D) to select one radio channel from a wide range of transmitted channels
40. Which of the following is used to provide tracking between RF amplifier and local oscillator stages of the receiver ?
- (A) Variable tuning inductor
 - (B) Ganged tuning inductor
 - (C) Variable capacitor
 - (D) Variable preset

41. A UJT has :
- (A) Anode, cathode and gate
 - (B) Two anodes and one gate
 - (C) Emitter, base and collector
 - (D) One emitter and two bases
42. A silicon controlled switch is :
- (A) an unilateral device with a gate
 - (B) an unilateral device with two gates
 - (C) a bidirectional device
 - (D) a bilateral device with two gates
43. An SCR is :
- (A) 3 layer, tri-junction device
 - (B) 3 layer, four-junction device
 - (C) 4 layer, tri-junction device
 - (D) 4 layer, 4-junction device
44. The following material is *not* suitable for LED :
- (A) Si
 - (B) GaAs
 - (C) InGaAs
 - (D) GaAsP
45. Gas lasers are *not* preferred for optical fiber communication because of :
- (A) Low directionality
 - (B) High numerical aperture
 - (C) Physical compatibility
 - (D) Reliability issues

46. For catching glitches in a event, the important parameter for a DSO is :

- (A) Number of A/D channels
- (B) Vertical resolution
- (C) Real time bandwidth
- (D) Memory length of DSO

47. Gauge factor of a strain gauge depends upon :

- (A) Young's modulus
- (B) Poisson's ratio
- (C) Length of the strain gauge
- (D) Thickness of the strain gauge

48. The difference between spectrometer and spectrophotometer is that, the spectrophotometer uses :

- (A) Optical array detector
- (B) High resolution gratting
- (C) White light source
- (D) Thermal detectors

49. The characteristic equation of a feedback control system is :

$$s^3 + ks^2 + 5s + 10 = 0$$

For the system to be critically stable the value of k should be :

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

50. PID controller is a controller with :

- (A) open loop control
- (B) three terms having adjustable gain for each term
- (C) three terms with adjustable gain for proportional term only
- (D) ability for feed forward control

AUG - 38215/II

ROUGH WORK

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