# PAPER-III ELECTRONIC SCIENCE

Si	gnature and Name of Invigilator										
1.	(Signature)	С	MR Sh	eet l	No. :						
	(Name)				(To	be fil	led by	the C	Candio	date)	
2.	(Signature)	R	oll No.								
	(Name)	_			(In fi	gures	as per	r adm	ission	card)	
	0 8 8 1 4	R	oll No. <u>-</u>		(	In wo	ords)				
Tiı	me : $2^{1}/_{2}$ hours]						[Ma	aximu	ım M	Iarks	: 150
Νι	umber of Pages in this Booklet : 16			Num	ber o	f Que	stion	s in t	his B	ookle	t : 75
	Instructions for the Candidates			τ	प्ररीक्षा	ू थेयों वे	न लिए	िनिर्देष	т		
1. 2.	Write your roll number in the space provided on the top of this page. This paper consists of seventy five multiple-choice type of	1. 2.	इस पृष्ठ वे इस प्रश्न-प	के ऊपर 1त्र में ' पाभ वो	र नियत पचहत्तर ने पर	स्थान प बहुविक प्रथन परि	गर अप ज्ल्पीय ! मेनका	ना रोल प्रश्न हैं आएको	नम्बर । टे.टी	लिखिए जारोगी	। । प्रदल्वे
3.	questions. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below : (i) To have access to the Question Booklet tear off the	5.	पाँच मिनत जाँच के वि (i) प्रश्न की	ट्र आप लए दिख -पुस्तिक सील व्	को प्रश् को प्रश् ये जायेंग ज खोल को फाड़	त्र-पुस्तिव न-पुस्तिव ो, जिसव ने के ति 5 लें. ।	का खोल की जाँच नए उस खुली ह	लावजा लने तथ । आपव के कव हुई या	प पा ग उसव ने अवः र पेज बिना र	जावना की निम्न श्य करन पर लर्ग स्टीकर-स्	। पहला गलिखित गी है : 1 कागज गील की
	<ul> <li>(i) To have access to the Question Booklet, tear on the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.</li> <li>(ii) Tally the number of pages and number of questions</li> </ul>		पुस्ति (ii) कवर प्रश्न हें ।	का स्वं <b>7 पृष्ठ</b> ों की द्रोषपूर्ष	गैकार न पर छप संख्या र्ण पुस्ति	ा करें । मे निर्देश को आ ाका ज़ि	ानुसार च्छी त नमें पृष	ँ प्रश्न₋ रह चैव ठ⁄प्रश्न	पुस्तिक ह कर कुम हो	गके पृ लें कि गंया दुव	ष्ठ तथा ेये पूरे न्नारा आू
	in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.		गय त्रुटि लोट इसवे तो उ अति (iii) इस पर उ	हां या पूर्ण प् कर उ ह लिए आपकी रिक्त जाँच के अंकित	सारिय पुस्तिका सके स्थ आपक प्रश्न-पु समय कि बाद ( कर दें	गल म <sub>ें</sub> थान पर को पाँच स्तिका क देया जा OMR प	न हो जर न दूसरी मिनट वापस त येगा । त्रक क	अथात् करें त सही ! दिये ज ती जाये ो क्रम र	ाकसा ाथा उ प्रश्न-पुर्ग गो औ गी औ	भा प्रव सी सम् स्तिका ( उसके र न ही स प्रश्न	गर का ाय उसे ले लें । बाद न आपको पुस्तिका
4.	<ul><li>(iii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.</li><li>Each item has four alternative responses marked (A), (B), (C) and (D). You have to dorken the circle as indicated below on</li></ul>	4.	प्रत्येक प्रश् गये हैं । उ जैसा कि	न के ति आपको नीचे दि	लेए चार सही उ खाया ग	उत्तर वि त्तर के व ाया है ।	वेकल्प वृत्त को	(A), (] पेन से	B), (C भरकर	) तथा ( काला	D) दिये करना है
	the correct response against each item. <b>Example :</b> $(\Delta \otimes B) \otimes (D \otimes B)$	5	<b>उदाहरण</b> जबकि (C) प्रश्नों के उ	: (A) ) सही नग केव	B उत्तर है पल पण्च	• ( ।	D जकेश	च्च दिर	ने मरो (	лмр т	वकार
5.	Your responses to the items are to be indicated in the <b>OMR</b> <b>Sheet given inside the Booklet only.</b> If you mark at any place other than in the circle in the OMR Sheet, it will not be	5.	ही अंकित ही अंकित किसी अन् नहीं होगा	करने हैं य स्थान ।	हे । यदि न पर उन्	आप 0 तर चिह	MR पः नांकित	करते हैं	दिये गये हैं, तो उ	गे वृत्त के उसका म्	अलावा (ल्यांकन
6	evaluated.	6. 7	अन्दर दिय	। गये । ग (Dec	नदशा व संबंध अर्थ	को ध्यान रजनार) न	ापूर्वक ' गा गगिव	पढ़ा। स्वयके	्यान्त्रिया	ח באח ו	ग करों ।
0. 7. 8.	Read mistiletions given mistle carefully. Rough Work is to be done in the end of this booklet. If you write your Name, Roll 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 such as change of response by scratching or using white fluid you will concern our science in the discussion of the space.	8.	यदि आप नम्बर, फो सके, अंवि अन्य अनु उत्तर को अयोग्य घ	न (R0 OMR न नम्ब न्रत कर चित स मिटान षित बि	पट्टा भ पत्रक र या क ते हैं अ ाधन क ा या स कये जा	पर निय गेई भी ग थवा आ ग प्रयोग गफेद स्य स्कते हैं	त स्थान ऐसा चि भद्र भाष करते गही से	ाजा के अ हन जिन् मा का प्र हैं, जैसे बदलन्	लावा उ ससे आ प्रयोग व ा कि उ ना तो	ा पृष्ठ प अपना न एकी पह हरते हैं, अंकित र् परीक्षा	र फर न म, रोल चान हो या कोई केये गये के लिये
9.	You have to return the test question booklet and Original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry original question booklet and duplicate copy of OMR Sheet on conclusion of examination	9. 10.	आपको प निरीक्षक म उसे अपने परीक्षा सम प्रति अपने <b>केवल नी</b>	रीक्षा स महोदय साथ प पाप्ति प साथ व <b>ले/काले</b>	गमाप्त ह को लौट परीक्षा भ र मूल प्र ले जा र <b>बाल</b>	होने पर टाना आग भवन से प्रश्न-पुसि प्रिकते हैं <b>प्वाईंट</b>	प्रश्न-पुं वश्यक बाहर तका त । <b>पेन क</b>	स्तिका है और न लेकर था OM <b>ग ही इ</b>	एव मूत परीक्षा ( जायें (R पत्र इस्तेमाल	ल OM समाप्ति । हालां क की <sup>5</sup> <b>न करें</b>	R पत्रक के बाद के आप डुप्लीकेट I
10.	Use only Blue/Black Ball point pen.	11.	किसी भी	<u>प्रकार</u>	का संग	ाणक (व	कैलकुल	ोटर) य	ा लाग	टेबल अ	गदि का
11. 12	Use of any calculator or log table etc., is prohibited.	12.	प्रयाग वा गलत उत्तर	जत ह रों के वि	। लेए कोई	ई नकार	ात्मक अ	अंक नर्ह	ों हैं ।		
12.						• •					
	D-88-14										

#### ELECTRONIC SCIENCE PAPER – III

- Note: This paper contains seventy five (75) objective type questions of two (2) marks each. All questions are compulsory.
- 1. The basic purpose of biasing a transistor with a network is
  - (A) to reduce the power dissipation
  - (B) to improve the gain
  - (C) to improve the stability
  - (D) to improve the frequency response
- 2. The depletion capacitance  $C_j$  of an abrupt p-n junction diode with uniform doping on either side varies with reverse  $V_R$  as

(A) 
$$C_j \propto V_R$$
  
(B)  $C_j \propto V_R^{-1}$   
(C)  $C_j \propto V_R^{-1}$   
(D)  $C_j \propto V_R^{-1}$ 

3. The Laplace transform converts integro-differential equation in \_\_\_\_\_\_ domain.

(A)	6	(B)	S

- (C) jw (D) ξ
- **4.** The switch is thrown to position 1. What will be the current in the circuit in the steady state condition ?



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

5. Which of the following oscillations makes use of both positive and negative feedback ?

2

- (A) Hartley (B) Collpitt
- (C) Phase shift (D) Wein Bridge
- **6.** The active filter works well
  - (A) at all frequencies (B) at high frequencies
  - (C) at zero frequency (D) at audio freq

Paper-III

(D) at audio frequencies

7. The number of flip-flops required to divide input frequencies by (32)

(A)	3	(B)	4
(C)	5	(D)	6

- 8. Which flip-flop can be used as latch ?
  - (A) R-S Flip-flop (B) J-K Flip-flop
  - (C) T- Flip-flop (D) D- Flip-flop

9. The I/O devices can be accessed in a memory map using the  $8085 \mu p$  instruction

- (A) IN addr or OUT addr
- (B) LDA addr or STA addr
- (C) MOV M, A or MOV A, M
- (D) MVI M data

**10.** Which flag of 8051 works as 1-bit accumulator ?

- (A) C (B) FO
- (C) P (D) OV

11. Which bitwise operator is suitable for turning off a particular bit in a number ?

- (A) && operator (B) & operator
- (C) || operator (D) ! operator

12. Which storage class is used for the variables that are often required in a program ?

- (A) STATIC (B) REGISTER
- (C) EXTENT (D) AUTO
- **13.** When the Q of an antenna increases, the bandwidth
  - (A) increases (B) decreases
  - (C) remains constant equal to zero (D) equal to unity
- **14.** The information capacity (bits/sec.) of a channel with bandwidth W and transmission time T is given by

(A) WT (B) 
$$\frac{W}{T}$$

(C) 
$$\frac{T}{W}$$
 (D)  $\frac{W^2}{T}$ 

- **15.** \_\_\_\_\_ diode is not used as a microwave mixer or detector.
- (A) Schottky diode
  (B) PIN
  (C) Crystal
  (D) Backward **Backward**

16.	A su	per-heterodyne receiver has a	n intermed	iate frequency (IF) of 465 kHz. If it is tuned						
	to a station broadcasting at 500 kHz and its oscillator operating at 965 kHz, then image									
	(A)	1520 kHz	<b>(D</b> )	1420 547						
	$(\mathbf{A})$	1350 KHz	(B) (D)	1020 kHz						
	(C)	1210 KHZ	(D)	1020 KHZ						
17.	UJT	relaxation oscillator is a specia	al case of							
	(A)	Astable multivibrator								
	(B)	Monostable multivibrator								
	(C)	Bistable multivibrator								
	(D)	Astable multivibrator with du	ration of t	ne semistable state zero						
18.	Afte	r firing an SCR, if the gate puls	se is remov	red, the SCR current						
	(A)	remains the same	(B)	reduces to zero						
	(C)	rises up	(D)	rises a little and then falls to zero						
19.	In a	normal ECG wave form, which	n wave has	the maximum amplitude ?						
	(A)	P-wave	(B)	R-wave						
	(C)	Q-wave	(D)	T-wave						
20.	If th	e characteristic equation of a cl	osed loop	system is $S^2 + 2S + 2 = 0$ , then the system is						
	(A)	over damped	(B)	critically damped						
	(C)	underdamped	(D)	undamped						
21.	The	doping concentration of n-p-n	transistor a	re						
	i.	$5 \times 10^{18}$ / cm <sup>3</sup>								
	ii.	$10^{17}$ / cm <sup>3</sup>								
	iii.	$2 \times 10^7 / \text{cm}^3$								
	Iden	tify the regions in the above or	der i, ii and	l iii.						
	(A)	C, B, E	(B)	E, B, C						
	(C)	С, Е, В	(D)	Е, С, В						
22.	Whi	ch is not a proper way of array	declaration	n ?						
	(A)	int num $[6] = \{2, 4, 12, 5, 45,,,,,,, .$	5}							
	(B)	int a(25);								
	$(\mathbf{C})$	$\inf n[] = \{2, 4, 12, 5, 45, 5\}$	22 / 11	21						
	(D)	$10at \text{ press } [] = \{12.3, 34.2, -1, -1\}$	-23.4, -11.	5}						
23.	Exp	onentiation operation in C is ca	rried out a	S						
	(A)	a = 3 * * 2	(B)	$a = 3 ^ 2$						
	(C)	a = pow(3, 2)	(D)	$a = 3 \exp(2)$						

4

**D-88-14** 

- 24. The phase method for generation of a SSB signal is most suitable for
  - (A) data signals
  - (B) weak modulating signals
  - (C) larger bandwidth modulating signals
  - (D) smaller bandwidth modulating signals
- 25. Which of the following sensors has excellent linearity ?
  - (A) RTD (B) Thermo-couple
  - (C) Radiation Pyrometer (D) Si based IC chip

26. The sinusoidal transfer functions are commonly represented by

- (A) Routh's criteria (B) Nyquist criteria
- (C) Bode Plot (D) Root Locas

27. Which of the following digital modulation systems support high bit rate ?

- (A) ASK (B) PSK
- (C) FSK (D) ASK & FSK



What is the modulus of the counter?

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

**29.** Pointer Vector for an electromagnetic wave is

(A)	$\vec{H} \cdot \vec{E}$	(B)	$\vec{H} \times \vec{E}$
(C)	$\vec{E} \times \vec{H}$	(D)	$\overrightarrow{E}\cdot \overrightarrow{H}$

**30.** An amplifier has open-loop voltage gain of 40.10% of negative feedback is effected. What will be the gain with feedback ?

5

(A)	40	(B)	32
(C)	16	(D)	8

**D-88-14** 

- **31.** In a p-n junction diode
  - 1. In reverse bias mode the bulk resistance is dominant.
  - 2. The junction impedance is variable.
  - (A) Statements 1 and 2 are correct.
  - (B) Statements 1 and 2 are wrong.
  - (C) Statement 1 is wrong while statement 2 is correct.
  - (D) Statement 1 is correct while statement 2 is wrong.
- **32.** Read the following statements :
  - ST 1: y-parameters can be obtained from Z parameters.
  - ST 2 : It is not necessary to define y-parameters separately.
  - (A) ST 1 is correct, ST 2 is wrong.
  - (B) ST 1 is wrong, ST 2 is correct.
  - (C) ST 1 and ST 2 are wrong.
  - (D) ST 1 and ST 2 are correct.
- **33.** Negative feedback in amplifier results in
  - 1. reduced voltage gain
  - 2. reduced bandwidth
  - 3. increased S/N ratio
  - 4. reduced distortion of these
  - (A) 1 and 2 are correct.
  - (C) 2, 3 and 4 are correct. (D)
- **34.** K-map method of simplifications can not be applied when the given functions is in
  - 1. Sum of product forms
  - 2. Product of sum forms
  - 3. Canonical forms
  - 4. Can be applied to all forms
  - (A) 1 and 2 are correct. (B) 1, 2 and 4
  - (C) 3 only
- (B) 1, 2 and 4 are correct.

(D) 2 & 4 are correct.

- **35.** Read the following statements :
  - ST 1 : Queue is provided in 8086.
  - ST 2 : Slow memory does not degrade speed operation of 8086.
  - (A) ST1 and ST2 are wrong.
  - (B) ST1 and ST2 are correct.
  - (C) ST1 is wrong and ST2 is correct.
  - (D) ST1 is correct and ST2 is wrong.

- (B) 1, 3 and 4 are correct.
- (D) 1 and 2 are correct.

**36.** Which operators can be used with float ?

- 1. %
- 2. \*
- 3. /
- 4. =
- (A) operators 1, 2 (B) operators 1, 2, 3
- (C) operators 2, 3, 4 (D) operators 1, 2, 3, 4

#### **37.** Binary ASK modulation gives

- ST1 : High noise immunity
- ST2 : Large bandwidth
- (A) ST1 is wrong, ST2 is correct.
- (B) ST1 is correct, ST2 is wrong.
- (C) ST1 and ST2 are wrong.
- (D) ST1 and ST2 are correct.

#### **38.** Which of the following are Maxwell equations ?

1.	$B = \mu H$	2.	$E = \frac{D}{\epsilon}$
3.	$E = \frac{J}{\sigma}$	4.	$E = \in D$

Select the correct answer :

- (A) 1, 2 and 3
  (B) 2, 3 and 4
  (C) 3 and 2
  (D) 3 and 1
- **39.** For SCR which statements are correct ?
  - ST1 : SCR should be fired with zero gate current.
  - ST2 :  $\frac{dv}{dt}$  failure occurs due to temperature.
  - (A) ST1 and ST2 are wrong.
  - (B) ST1 and ST2 are correct.
  - (C) ST1 is correct and ST2 is wrong.
  - (D) ST1 is wrong, ST2 is correct

#### **40.** In comparison to LED, LASER has

- 1. high emission frequency
- 2. no tuning arrangement
- 3. narrow spectral bandwidth
- 4. provision for confinement of these
- (A) 1, 3 and 4 are correct.
- (B) 1, 2 and 4 are correct.
- (C) 1 and 3 are correct. (D) 2, 3 and 4 are correct.

7

- 41. Which of the following are useful in comparing the noise performance of receivers ?
  - 1. Input noise voltage
  - 2. Equivalent noise resistance
  - 3. Noise temperature
  - 4. Noise figure

Select the correct answer.

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

42. Which is not the effect of addition of open loop zeroes on the stability of the system ?

increasing stability
 decreasing stability
 decreasing stability
 shifting root-locas towards imaginary axis
 1, 2, 3
 1, 2, 3
 1, 3, 4
 1, 2, 4

#### **43.** Consider the following :

- 1. In semiconductors, the mobility of electrons is more than that of holes.
- 2. In semiconductors, the resistivity increases with the increase in temperature.
- 3. Metal has positive TCR.
- 4. In metals, thermal conductivity is inversely proportional to electronic conductivity at a particular temperature.

Which of the following statements are correct?

- (A) 1, 2, 3(B) 1, 2, 4(C) 2, 3, 4(D) 1, 3, 4
- 44. Which of the following circuits will have transients ?
  - 1. Resistive
  - 2. R-L
  - 3. R-C
  - 4. R-L-C
  - Which is correct?
  - (A) 1, 2(B) 2, 3(C) 3, 4(D) 2, 3, 4

#### **45.** Consider the following :

- ST1 : F.M. signal produces more side bands than A.M.
- ST2 : The carrier in a F.M. signal can never be dropped to zero amplitude.

Which of the following is valid ?

- (A) Neither ST1 nor ST2 (B) Both ST1 and ST2
- (C) ST1 and not ST2 (D) ST2 and not ST1

Paper-III

**46.**  $8085 \,\mu p$  instructions are given below

- 1. STA addr
- 2. CALL addr
- 3. MOV  $R_d$ ,  $R_s$
- 4. ADI data

Arrange these in the ascending order of number of clock cycles required to execute them.

- (A) 1, 2, 3, 4
  (B) 3, 4, 1, 2
  (C) 2, 4, 3, 1
  (D) 4, 3, 2, 1
- **47.** If  $P \longrightarrow Passivation$ ,  $Q \longrightarrow n$ -well implant,  $R \longrightarrow Metallization and <math>S \longrightarrow Source/drain diffusion$

The sequence in which these are carried out in a n-channel CMOS fabrication is

(A)	P - Q - R - S	(B)	Q - S - R - P
(C)	R - P - S - Q	(D)	S - R - Q - P

48. Arrange the following NINV – Op-Amps in the increasing order of the bandwidth :

- 1. unity gain
- 2. gain = 10
- 3. gain = 100
- 4. gain = 20
- (A) 1, 2, 3, 4(B) 2, 3, 4, 1(C) 1, 2, 4, 3(D) 3, 2, 1, 4
- **49.** Arrange the following devices in the increasing order of 8-bit general purpose registers these contain :
  - 1. 8085
  - 2. 8051
  - 3. 8086
  - 4. 8255
  - (A) 4, 1, 3, 2
    (B) 1, 4, 3, 2
    (C) 3, 2, 4, 1
    (D) 2, 3, 1, 4

50. Arrange in the increasing order of temperature coefficient :

- 1. Zener diode with breakdown voltage 6 V
- 2. Zener diode with breakdown voltage > 6V in series with a p-n diode
- 3. Zener diode with breakdown voltage < 6 V
- 4. Zener diode with breakdown voltage < 6 V in series with a Si-Pn junction diode
- (A) 3, 2, 4, 1 (B) 4, 1, 3, 2
- (C) 2, 3, 1, 4 (D) 1, 4, 2, 3 -14 9 Paper-III

51.	Mat	ch th	e give	n lists	:		
			List	– I			List – II
	(	Nam	e of t	he Dev	vice)		(Application)
	a.	Die	ode			i.	Rectification
	b.	Tu	nnel d	iode		ii.	Microwave switching
	c.	Zei	ner dio	ode		iii.	An oscillator
	d.	PI	N diod	e		iv.	Voltage regulation
	Cod	es :					
		a	b	c	d		
	(A)	i	iii	iv	ii		
	(B)	i	iv	iii	ii		
	(C)	i 	ii	iv	iii		
	(D)	11	1V	111	1		
52.	Mat	ch th	e give	n lists	:		
			Lis	st – I			List – II
	a.	Co	nditio	n of re	ciprocity		$Z_{12}$
						1.	$\overline{Z_{22}}$
	b.	h <sub>12</sub>	!			ii.	$Z_{12} = Z_{21}$
	c.	。	~~~~		R R R R	iii.	Z
	d.	Co	nditio	n of sy	mmetry	iv.	$Z_{11} = Z_{22}$
	Cod	es :					
		a	b	c	d		
	(A)	iv	iii	ii	i		
	(B)	ii	i	iii	iv		
	(C)	1	11	IV	111 		
	(D)	111	1V	1	11		
53.	Mat	ch th	e follo	wing :			
		]	List –	I			List – II
	a.	CE	l-ampl	ifier	i.	Low	bandwidth high input impedance amplifier
	b.	CB	-ampl	ifier	ii.	Audio	o frequency amplifier
	c.	JFI	ET am	plifier	iii.	Radio	frequency amplifier
	d.	CC	C-ampl	ifier	iv.	Buffe	r amplifier
	Cod	les :					
		a	b	c	d		
	(A)	i	ii	iii	iv		
	(B)	ii	iii	i	iv		
	(C)	iv	iii	ii	i		
	(D)	iii	ii	i	iv		

# Paper-III

## **54.** Match the following :

	Li	st – I			List – II
a.	Shi	Shift Register		i.	Frequency Division
b.	Мu	Multiplexer		ii.	Memory chip select generation
c.	Decoder		iii.	Parallel to serial conversion	
d.	Counter		iv.	Many to one switch	
Cod	les :				
	a	b	c	d	
(A)	i	ii	iii	iv	
(B)	iii	iv	ii	i	

### **55.** Match the following :

(C) ii

(D) iv

iii

i

	List – I		List – II			
a.	8051	i.	serial data transfer			
b.	8086	ii.	bit addressable RAM			
c.	8085	iii.	bit set mode			
d.	8255	iv.	variable port addressing			
Codes :						
	a b	с	d			

i

iii

iv

ii

	a	D	C	a
(A)	i	ii	iii	iv
(B)	ii	iv	i	iii
(C)	iii	iv	i	ii
(D)	iv	iii	ii	i

## **56.** Match the following :

List – I	List –	Ι
----------	--------	---

### List – II

a.	Re	lationa	al oper	rator	i.	Executed atleast once
b.	wh	ile (1)			ii.	to exit the loop
c.	do	-while			iii.	&&
d.	bre	ak			iv.	infinite loop
Cod	es :					
	a	b	c	d		
(A)	i	ii	iii	iv		
(B)	ii	iv	i	iii		

(C)	iii	iv
(D)	iv	iii

i

ii

ii

i

#### **57.** Match the following :

#### List – I

- a. Loop antenna
- b. Rhombic antenna
- c. Folded dipole
- d. Horizontal antenna

#### **Codes**:

	a	b	c	d
(A)	i	ii	iii	iv
(B)	ii	i	iv	iii
(C)	iii	ii	i	iv
(D)	iv	iii	ii	i

#### **58.** Match the following :

#### List – I

#### List – II

Heavily doped

List – II

long wire antenna

300 ohms

sharp broadside null

horizontal polarization

i.

ii.

iii.

iv.

i.

i.

- a. LEDb. Avalanche Photodiode
- c. Tunnel diode
- d. LASER
- ii. Coherent radiationiii. Spontaneous emissioniv. Current gain

#### Codes :

	a	b	c	d
(A)	ii	i	iii	iv
(B)	iv	iii	ii	i
(C)	iii	iv	i	ii
(D)	iii	ii	i	iv

#### **59.** Match the following :

List – I

- a. Maxwell's Bridge
- b. Hay's Bridge
- c. Schering's Bridge
- d. Wein's Bridge

#### Codes :

	a	b	С	d
(A)	i	ii	iii	iv
(B)	iv	iii	ii	i
(C)	iv	ii	iii	i
(D)	i	iii	ii	iv

#### List – II

- Measurement of unknown inductance
- ii. Measurement of High Q coils
- iii. Precision measurement of capacitance
- iv. To measure frequency

#### Paper-III

#### 60. Match the following :

List –	
--------	--

- Storage oscilloscope a.
- b. Sampling oscilloscope
- High frequency oscilloscope c.
- d. Low frequency oscilloscope
- **Codes :**

	a	b	c	d
(A)	i	ii	iv	iii
(B)	iii	ii	i	iv
(C)	iv	i	ii	iii
(D)	ii	iv	i	iii

#### List – II

i.

ii.

iii.

iv.

- Time domain
- Long term memories
- Servo system analyzer

Directions for questions 61 to 70 : The following items consists of two statements, one labelled the "Assertion (A)" and the other labelled "Reason (R)". You are to examine the two statements carefully and decide if the Assertion (A) and Reason (R) are individually true and if so, whether the reason is a correct explanation of the Assertion. Select your answer to these items using the codes given below and mark your answer accordingly.

#### **Codes :**

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A).
- Both (A) and (R) are true, but (R) is not correct explanation of (A). (B)
- (A) is true, but (R) is false. (C)
- (D) (A) is false, but (R) is true.

<b>D-88</b>	-14		13	Paper-III
	Reason (R)	:	Any program written for 8086 will run without changes on 80	85.
65.	Assertion (A)	:	Any program written for 8080 will run without any changes o	n 8085.
	Reason (R)	:	Dual slope (A/D) converter provides high accuracy while a time suppresses the HUM effect on the input signal.	t the same
64.	Assertion (A)	:	Dual slope (A/D) converter is the most preferred conversion employed in most of the digital multimeters.	technique
	Reason (R)	:	A small signal amplifier amplify weak measured signals.	
63.	Assertion (A)	:	Op-Amp is used for sensor circuit.	
	Reason (R)	:	Capacitor input filters produce more heating in the rectifiers.	
62.	Assertion (A)	:	Capacitor input filter gives a high output voltage which dr load is increased.	ops as the
	Reason (R)	:	In zener breakdown the temperature coefficient is positive.	
61.	Assertion (A)	:	In avalanche breakdown, the temperature coefficient is positiv	/e.

Pulse testing

66.	Assertion (A) :	'C' provides a switch statement.
	Reason (R) :	In order to select one alternative out of many, there is no provision in C. It has to be done by user defined function.
67.	Assertion (A) :	The system of propagation in waveguide is in accordance with field theory.
	Reason (R) :	The system of propagation in transmission lines is in accordance with circuit theory.
68.	Assertion (A) :	Amplitude modulation is wastage of power.
	Reason (R) :	Amplitude modulation is wastage of bandwidth.
69.	Assertion (A) :	A number of thyristors operating in parallel cannot share a common heatsink.
	Reason (R) :	For simultaneous firing of the thyristor opto-isolator may be employed in the gate driving circuit.
70.	Assertion (A) :	The shift in the position of the bright spot on the CRO screen per unit change of voltage across the deflection plates is called deflection sensitivity.
	Reason (R) :	The path traveled by the spot on a CRO screen during the retrace time is called retrace path.

Read the passage and answer the questions **71** to **75** that follow based on your understanding of passage :

General methods of n/w analysis become laborious and time consuming for large and complex network. For such situations the solution is network theorems. Besides, the other features of n/w theorems are

- (A) they are applicable to a useful and fairly wide class of networks.
- (B) their conclusions are simple and
- (C) they sometimes provide good physical insight into the problems.

The maximum power transfer implies that the load impedance must be the complex conjugate of the source impedance. The superposition theorem is valid for any linear, time invariant or time varying. It is useful in circuit analysis when the n/w has large number of sources. Thevenin's or Norton's theorem is applicable to any number of time invariant or time varying n/w. It is useful when only one part of the n/w is varying, while the other part remains constant. Thevenin's equivalent ckt is the voltage source equivalent at the terminals concerned. Millman's theorem is the extension of Thevenin's or Norton's theorem for a number of Current or Voltage sources respectively. The substitution theorem is applicable to any network and can be applied to a branch which is not coupled to other branches of the network. Telleng's theorem is applicable to any lumped n/w regardless of the type of elements, which may be linear or non-linear, time varying or time invariant.

- 71. The principle of superposition is the property of
  - (A) additivity only
  - (B) homogeneity only
  - (C) combined property of additivity and homogeneity of linear n/w s
  - (D) additivity and associativity
- 72. Which equivalent circuits are dual ?
  - (A) Norton-Telleng
  - (B) Thevenin-Superposition
  - (C) Norton-Thevenin
  - (D) Thevenin-Millman
- 73. In Thevenin equivalent circuit which is incorrect :
  - (A) Independent voltage sources are open circuited.
  - (B) Independent voltage sources are short circuited.
  - (C) Dependent voltage sources are removed.
  - (D) Current sources are opened.
- **74.** For the n/w, find  $R_{TH}$



- $(A) \quad 2 \ \Omega \qquad \qquad (B) \quad 3 \ \Omega$
- $(C) \quad 4 \ \Omega \qquad \qquad (D) \quad 6 \ \Omega$
- **75.** Find out which of the following statements is wrong ? The principle of superposition is useful for
  - (A) linearity test of a system
  - (B) substituting sources by their shunt impedances.
  - (C) superposition applies to V-I relationship also
  - (D) In superposition theorem, response of each source is considered separately.

UGC NET DECEMBER - 2014 PAPER-3 Date. 12/06/2015 Pg. 76 SUBJECT CODE & NAME: - (88) Electronic Science

	QNO	ANS		QNO	ANS		QNO	ANS		QNO	ANS
	1	C		26	С		51	A		76	
	2	C		27	B		52	в		 77	
	3	B		28	D		53	D		78	
	4	B		29	С		54	B		79	
	5	D		30	D		55	B		80	
	6	D		31	С		56	С		81	
	7	С		32	A		57	A		82	
	8	A		33	B		58	С		83	
	9	B		34	Z		59	 A		84	
	10	 A		35	B		60	B		- <b></b> 85	
	11	B		36	С		61	C		86	
	12	B		37	A		62	B		87	
	13	B		38	A		63	A		88	
	14	D		39	A		64	A		89	
	15	B		40	С		65	C		90	
	16	B		41	С		66	C		91	
	17	D		42	С		67	B		92	
	18	С		43	D		68	A		93	
	19	в		44	D		69	D		94	
	20	C		45	B		70	в		95	
	21	D		46	B		71	C		96	
	22	в		47	B		72	C		97	
	23	C		48	С		73	 A		98	
	24	D		49	A		74	B		99	
	25	D		50	B		75	в		100	

Z=ALL OPTIONS ARE CORRECT/ 1=A & B OPTIONS ARE CORRECT/ 2=A & C OPTIONS ARE CORRECT/ 3=A & D OPTIONS ARE CORRECT/ 4=B & C OPTIONS ARE CORRECT/ 5=B & D OPTIONS ARE CORRECT/ 6=D & C OPTIONS ARE CORRECT/ 7=A, C & D OPTIONS ARE CORRECT/ 8=A, B & C OPTIONS ARE CORRECT