

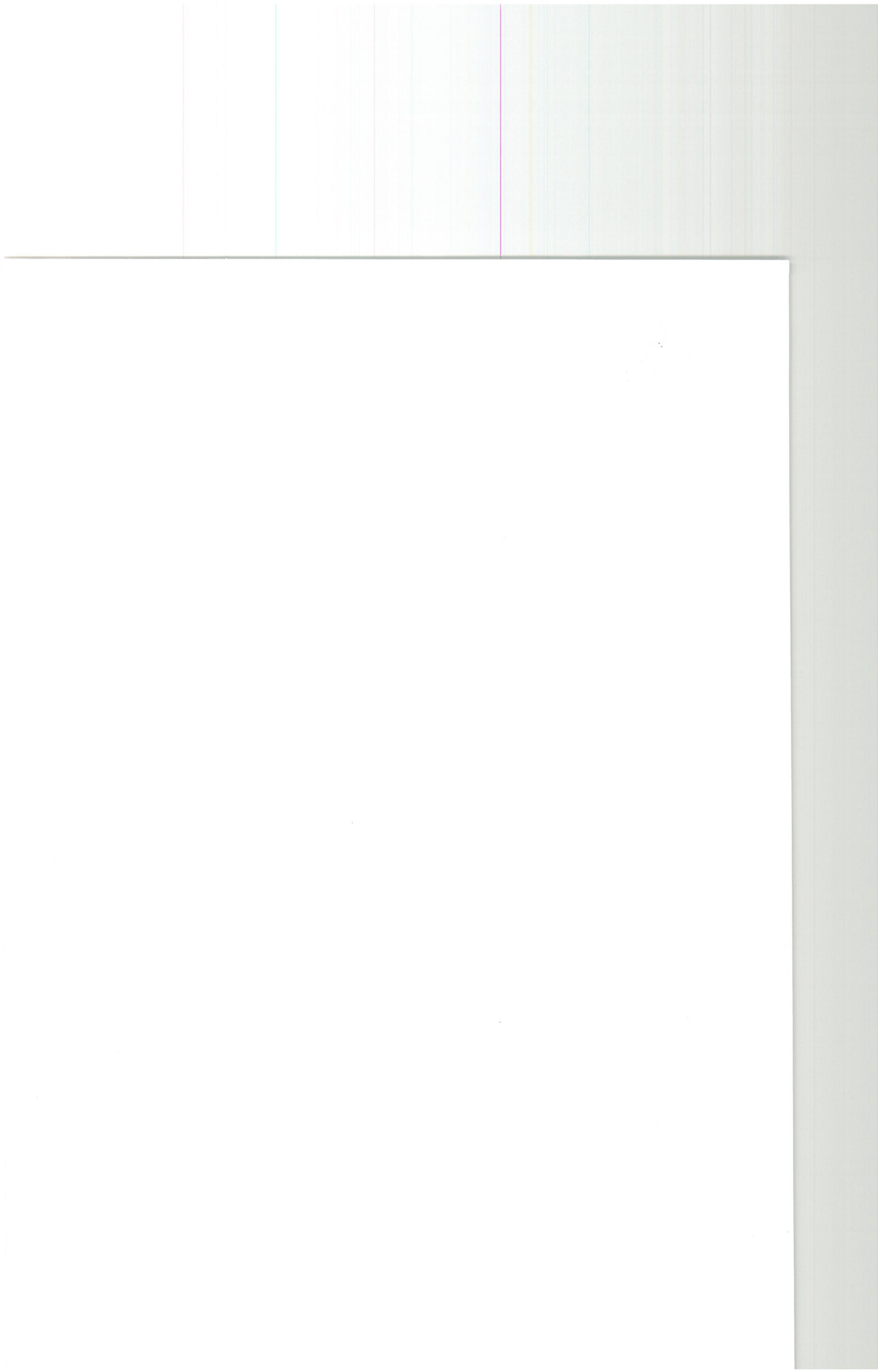


Tel.: 07/769014

الامتحانات الرسمية لشهادة الإمتياز الفني

دورة عام ٢٠٢٠

اختصاص الإلكترونيك



Circle the correct answer: (1point/correct answer)

1) The Foster seeley discriminator is used in

- a) In the AM receiver
- b) In the FM receiver.
- c) In the FM transmitter.

2) Ring modulator is used as

- a) FM modulator.
- b) PM modulator.
- c) AM modulator.

3) Varicap is used in

- a) PM modulator.
- b) FM modulator.
- c) AM modulator

4) What do you understand by high level AM?

- a) Output power is low
- b) Modulation is done at high power of carrier and modulating signal
- c) No need to boost the carrier and modulating signal

5) Find lower frequency component in AM wave, given that highest frequency component is 900KHz and bandwidth is 12 KHz?

- a) 600 KHz
- b) 868 KHz
- c) 888 KHz

6) What do you understand by the term "carrier"?

- a) Waveform with constant frequency, phase and amplitude
- b) Waveform for which frequency, amplitude or phase is varied
- c) waveform with high amplitude, low frequency and constant phase

7) If the modulating frequency of a carrier wave varies between 700Hz and 7KHz, find it's bandwidth?

- a) 23 KHz
- b) 17.3 KHz
- c) 12.6 KHz

8) Maximum Amplitude of an amplitude modulated 10V and minimum amplitude is 5V. Find its modulation index?

- a) 0.65
- b) 0.9
- c) 0.33

9) Calculate power in each sideband, if power of carrier wave is 96W and there is 40% modulation in amplitude modulated signal?

- a) 11.84W
- b) 6.84W
- c) 3.84W

10) Power of carrier wave is 300W and modulation index is 0.75. Find its total power?

- a) 465W
- b) 384W
- c) 323W

11) If a wave is modulated by two waves. One of them has modulation index equal to 0.75 and other has 0.2, the total modulation index will be _____

- a) 0.58
- b) 0.77
- c) 0.35

12) The intermediate frequency of a superheterodyne receiver is 500KHz. What is the image frequency at 1200 KHz?

- a) 600KHz
- b) 500KHz
- c) 700KHz

13) What do you understand by the term SSB?

- a) Suppressed Side Band
- b) Single Side Band
- c) Suppressed Single Band

14) What is the frequency of audio modulation?

- a) 10 Hz
- b) 20 KHz
- c) 30 KHz

15) What is the main function of a balanced modulator?

- a) To produce balanced modulation of a carrier wave
- b) To suppress carrier signal
- c) To produce 100% modulation

16) Which of the following statement is true about frequency modulation?

- a) Noise gets decrease if we decrease deviation
- b) Noise gets decrease if we increase deviation
- c) Noise gets decrease by maintaining deviation constant

17) In a frequency modulated signal, the power _____ when the modulation index increases.

- a) Remains constant
- b) Increase
- c) Decrease

18) Standard intermediate frequency used for AM receiver is _____

- a) 455 MHz
- b) 455 KHz
- c) 455 Hz

19) What is the value of modulation index m , for overmodulation?

- a) $m < 1$
- b) $m = 1$
- c) $m > 1$

20) In automatic gain control of the AM receiver _____

- a) Gain of the receiver is adjusted
 - b) Gain adjustment depends upon the strength of received signal
 - c) Is an open-loop system
-

المعدل : (٢٠)
المدة : ٤٥ دقيقة

الاختصاص والرمز :
المادة :
المستندات المسموح بها :
الالكترونيك (٢٠٢٠٧) :
الالكترونيك القدرة واللواظ :
آلة حاسبة غير مبرمجة :

Circle the correct answer : (1pt / correct answer)

Part A: Power electronics

- 1- A triac is equivalent to two SCRs :
a- In parallel
b- In series
c- In inverse-parallel
- 2- The V-I characteristics for a triac in the first and third quadrants are essentially identical to those of in its first quadrant:
a- Transistor
b- SCR
c- UJT
- 3- A triac can pass a portion of half-cycle through the load:
a- Only positive
b- Only negative
c- Both positive and negative
- 4- A diac has terminals:
a- Two
b- Three
c- Four
- 5- A triac has Semiconductor layers:
a- Two
b- Three
c- Four
- 6- A diac has pn junctions:
a- Four
b- Two
c- Three
- 7- Power electronics essentially deals with control of a.c. power at:
a- Frequencies above 1000 kHz
b- Frequencies less than 10 Hz
c- 50 Hz frequency
- 8- When the emitter terminal of a UJT is open, the resistance between the base terminal is generally:
a- High
b- Low
c- Extremely low
- 9- What is the name of the circuit of the figure 1:
a- Bridge rectifier triggers SCR
b- Low and high speed motor controller.
c- The 2 answers (a) and (b) are incorrect

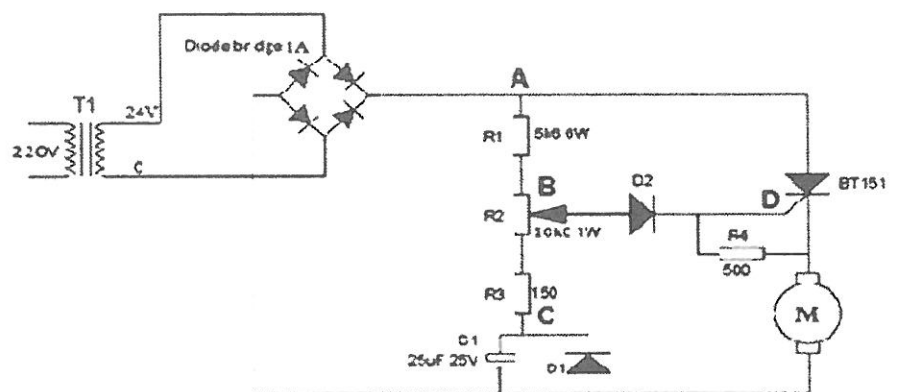
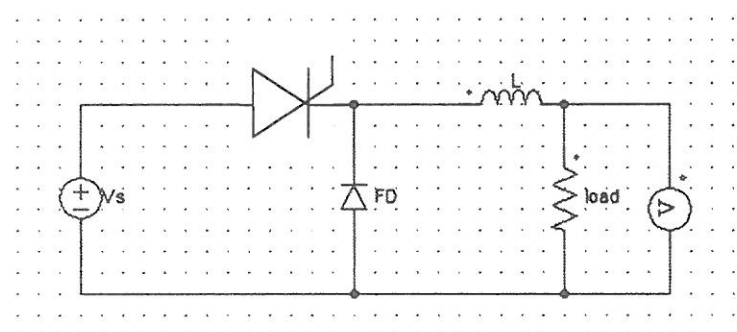


Figure 1

- 10- Find the output voltage expression for a step down chopper with V_s as the input voltage and α as the duty cycle.
a- $V_o = V_s/\alpha$
b- $V_o = V_s \times \alpha$
c- $V_o = V_s/2\alpha$
- 11- In the circuit Figure 2, when the thyristor is off:
a- voltage is non-zero and current is decaying
b- voltage is zero and current is rising
c- voltage is zero and current is decaying

Figure 2



12- In the diode rectifier circuit of the Figure 3, the diodes D1, D2 & D3 are connected to phases R, Y and B respectively as shown. The phase sequence is R-Y-B. The diode D1 would conduct from:

- a- 0 to 90 degrees
- b- 30 to 150 degrees
- c- 0 to 180 degrees

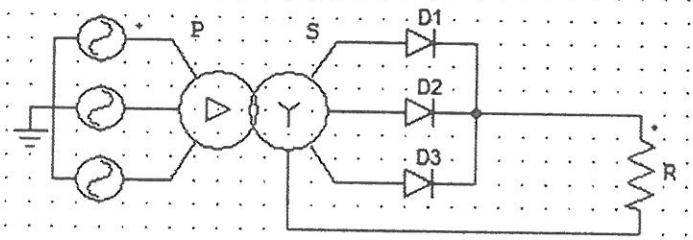


Figure 3

13- The circuit of the figure 4 is for a:

- a- 3-phase, 6-pulse, diode rectifier
- b- 3-phase, 6-pulse, diode inverter
- c- 3-phase, 3-pulse, diode rectifier

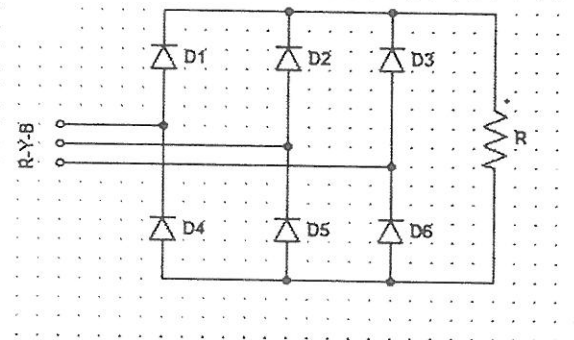


Figure 4

14- What is the name of the Figure 5?

- a- Triggering the thyristor by UJT.
- b- Triggering the thyristor by PUT.
- c- The answers (a) and (b) are incorrect.

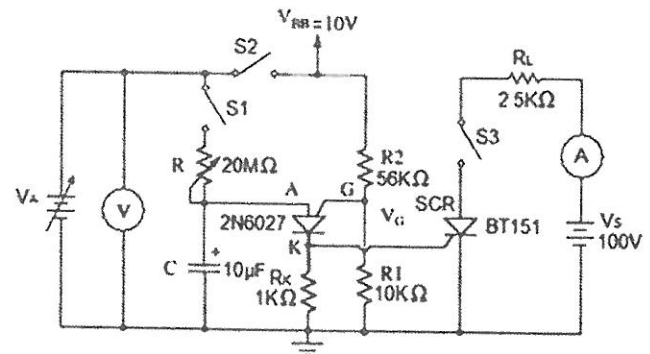


Figure 5

15- The figure 6 represents:

- a- The command circuit by two thyristors.
- b- AC/ AC converter.
- c- Automatic charger circuit.

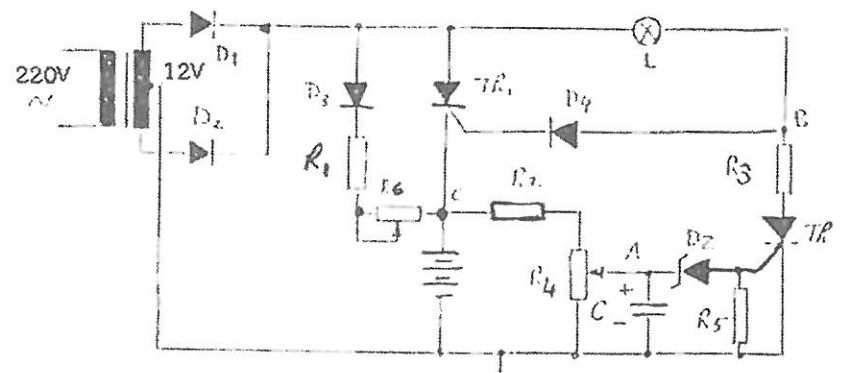


Figure 6

Part B: Sensors:

16- The motion sensors are essentially represented by:

- a- The resistive potentiometer, Variable Inductor, Differential Transformer, synchro machine.
- b- The variable surface capacitor, capacitor has variable spread and VCR.
- c- All of the above.

17- Positive Temperature Coefficient (PTC):

- a- PTC thermistors increase their resistance as the temperature rises.
- b- PTC thermistors increase their resistance as the temperature decreases.
- c- All of the above

18- Negative Temperature Coefficient (NTC):

- a- NTC thermistors decrease their resistance as the temperature increases.
- b- NTC thermistors increase their resistance as the temperature decreases.
- c- All of the above

19- Change in output of sensor with change in input is:

- a- Threshold
- b- Slew rate
- c- Sensitivity

20- The essential qualities of a sensor are expressed

- a- The quantity, the model and the precision.
- b- Fidelity, justness and precision.
- c- All of the above

المعدل : (٢٠)
المدة : ٤٥ دقيقة

Circle the correct answer:(1pt/correct answer)

1- Register that is used to holds the memory address of the next instruction to be executed is:

- a) Program Memory
- b) Program Counter
- c) Control Unit
- d) Instruction decoder

2-Which register is used to store the output generated by ALU?

- a) Special Function Register
- b) Timer Register
- c) Accumulator
- d) Stack Pointer

3- The sequence of operations in which PCM is done is

- a) Sampling, quantizing, encoding
- b) Quantizing, encoding, sampling
- c) Quantizing, sampling, encoding
- d) None of the above

4- The Zener diode acts like

- a) Battery.
- b) AC generator.
- c) Square generator.
- d) None of the above.

5- In the AM receiver the output of the mixer has an intermediate frequency:

- a) IF = 455 kHz.
- b) IF= 466 KHz.
- c) IF= 477 KHz.
- d) None of the above

6- The envelope detector is used in

- a) The AM receiver.
- b) The FM receiver.
- c) The PM receiver.
- d) None of the above

7- Poor sound quality

- a) Internal Speakers.
- b) Audio amplifier.
- c) Both a & b
- d) Broadcast problem.

8-Which of the following is called address operator?

- a) *
- b) &
- c) _
- d) %

9-The diode is

- a) Unidirectional current device.
- b) Bidirectional current device.
- c) Tridirectional current device.
- d) None of the above

10- The thyristor is

- a) Unidirectional current device.
- b) Bidirectional current device.
- c) Tridirectional current device.
- d) None of the above

11- The triac is

- a) Unidirectional current device.
- b) Bidirectional current device.
- c) Tridirectional current device.
- d) None of the above

12- The thyristor represents:

- a) Two transistors NPN.
- b) Two transistors PNP.
- c) Two transistors NPN and PNP.
- d) None of the above.

13- The UJT is used as

- a) Relaxation oscillator to produce the spike pulses.
- b) Square oscillator.
- c) Triangular oscillator.
- d) None of the above.

14- The thyristor is used as

- a) Rectifier.
- b) Amplifier.
- c) Generator.
- d) None of the above

15- The UJT will be ON

- a) At the peak value
- b) Less than the peak value.
- c) When the emitter of UJT is negative.
- d) None of the above.

16- The photodiode is called

- a) Optical sensor.
- b) Temperature sensor.
- c) Displacement sensor
- d) None of the above.

17- The NTC device is called

- a) Optical sensor.
- b) Temperature sensor.
- c) Displacement sensor
- d) None of the above.

18- The Diac is used as

- a) Pulses generator
- b) Amplifier.
- c) Sine waves generator
- d) None of the above.

19- The chopper is used to convert from

- a) AC/DC
- b) DC/AC
- c) DC/DC step down or step up voltage
- d) None of the above

20- The Inverter is used to convert from

- a) AC/DC
- b) DC/AC
- c) DC/DC step down or step up voltage
- d) None of the above

المعدل : (٢٠)
المدة : ٤٥ دقيقة

الاختصاص والرمز : الالكترونك (٢٠٢٠٣)
المادة : الالكترونك الرقمي
المستندات المسموح بها : آلة حاسبة غير مبرمجة

ضع دائرة حول الاجابة الصحيحة : (علامة لكل اجابة صحيحة)
PIC 16F84 و MP 6809

- (١) لدينا $W = (37)_H$ وموقع الذاكرة بعنوان $0x71$ يحتوي على $(B3)_H$ ، اذنفذنا التعليمة $[ADDWF 0x71, F]$ ، فإنه يعطي:
- أ) $W = (EA)_H$ ب) $(0x71) = (EA)_H$
ج) $W = (EB)_H$ د) $(0x71) = (EB)_H$
- (٢) لدينا $A = (37)_H$ وموقع الذاكرة بعنوان 0000 يحتوي على $(B3)_H$ ، إذا نفذنا التعليمة $[ADDA $0000]$ ، فإنه يعطي:
- أ) $A = (EA)_H$ ب) $(0000) = (EA)_H$
ج) $A = (EB)_H$ د) $(0000) = (EB)_H$
- (٣) إذا كان السجل $DDRA = (0000\ 0000)_B$ ، سيعمل **PORTA** تماماً على النحو:
- أ) مخرج ب) نصف المدخل-نصف المخرج
ج) مدخل د) لاشيء
- (٤) لدينا $W = (F0)_H$ وموقع الذاكرة بعنوان $0x60$ يحتوي على $(04)_H$ ، اذنفذنا التعليمة $[ANDWF 0x60, F]$ ، فإنه يعطي:
- أ) $W = (00)_H$ ب) $(0x60) = (04)_H$
ج) $W = (F4)_H$ د) $(0x60) = (00)_H$
- (٥) التعليمة **[RORB]** يحقق دوران نحو اليمين من محتوى سجل اسمه **B** :
- أ) مع الأخذ في الاعتبار محتوى العلم **C** وتخزين النتيجة في **B** .
ب) مع الأخذ في الاعتبار محتوى العلم **C** وتخزين النتيجة في **A** .
ج) لا تأخذ في الاعتبار محتوى العلم **C** وتخزين نتيجة في **A** .
د) لا تأخذ في الاعتبار محتوى العلم **C** وتخزين النتيجة في سجل **TEMPO** .
- (٦) إذا $DDRB = (0F)_H$ ، عندئذ البوابة **B (ORB)** سوف تعمل على النحو:
- a) الكل مثل المخرج b) نصف المدخل-نصف المخرج
c) الكل مثل المدخل d) لاشيء
- (٧) النتيجة إذا كانت التعليمة $[ANDLW 0xAA]$ مع $W = (FF)_H$ ستكون:
- أ) $W = (FF)_H$ ب) $W = (FA)_H$
ج) $W = (AA)_H$ د) $W = (00)_H$
- (٨) النتيجة إذا كانت التعليمة $[ANDB#$AA]$ مع $B = (FF)_H$ ستكون:
- أ) $B = (FF)_H$ ب) $B = (FA)_H$
ج) $B = (AA)_H$ د) $B = (00)_H$
- (٩) من الناحية الحسابية، التعليمة **[ROLA]** تعمل :
- أ) يقسم على ٢ المحتوى للمراكم **A**
ب) يقسم على ٤ المحتوى للمراكم **A**
ج) ضرب في ٢ المحتوى للمراكم **A**
د) ضرب في ٤ المحتوى للمراكم **A**
- (١٠) لتحقيق الفرق $(٣٥ - ١٤٣)$ مع $B = (35)_D$ ، نكتب التعليمة التالية:
- أ) **SUBB #\$23** ب) **SUBB #\$35**
ج) **SUBB #\$22** د) **SUBB \$0035**

الخ: [MOV 0X71, F] اليتيم (1) اليتيم (1)

(۱) حج و عمرہ کی بنیادیں

(c) (C, Z, \dots) is a \mathbb{Z} -module
(d) (0×72) is a \mathbb{Z} -module

:بعض ان اجنح DDR A الى الوصل الي احياء (١٠)

1) $CRA4 = 04$
2) $CRA4 = 08$

ۛ) CRA4 = 06
 ۛ) ORA = 4

LED إلى مخرج LED (1) : \$ 04 # LDB ، PORTB ، PIN PB3

1) STA \$PORTB
2) STA ORA

(ب) STA ORB
(د) STB ORB

٤ : B = (04) H و A = (02) H [MUL] اليتي اياها

$$\begin{aligned} H(80) &= A & (1) \\ H(80) &= B & (2) \end{aligned}$$

٢) $B = (02)_H$
 ٣) $A = (04)_H$

سکون: $A = (55)^H$ [NEGA] المثلث المثلث (أ) المثلث (أ)

- 1) $A = (AB)^H$
- 2) $B = (AB)^H$

$$\begin{aligned} H(95) &= V & (7) \\ H(VV) &= V & (8) \end{aligned}$$

١٦ (١) البتة

$$\begin{aligned} B &= (FF)^H & (1) \\ A &= (AV)^H & (2) \end{aligned}$$
$$\begin{aligned} \text{A)} \quad A &= (0A)^H \\ \text{B)} \quad B &= (00)^H \end{aligned}$$

02 \$ LDBB # : PORTA من PIN PAI الى موصول LED ليد (17)

1) STA PORTB
2) STA ORA

(ب) STA ORB
 (ج) STB ORB

4: الترخيص [COMF 0x72,F] يتلقى القيمة (AA) = (AA) H للقيمة (AA)

$$H(\zeta\zeta) = (ZLX0) \quad (2)$$

$$H(\zeta\zeta) = M \quad (1)$$
$$H(54) = W \quad (1)$$

١٩) (البينة) [COM\$00000] (08) H A = (74) H A = 00000

$$\begin{aligned} \text{1) } A &= (F7)^H \\ \text{2) } \$0000 &= (8B)^H \end{aligned}$$
$$\begin{aligned} \text{a)} \quad A &= (8B)^H \\ \text{b)} \quad (FL)^H &= 0000\$ \end{aligned}$$

PIA : 6821 (۸۰)

(1) $\frac{1}{x^2} = x^{-2}$ and
(2) $\frac{1}{x^3} = x^{-3}$

(د) يسلسليہ ميٽر - زيادہ و
 (ب) ميٽر - زيادہ

Circle the correct answer : (1 point/correct answer)

1. Sampling frequency of a signal is 6 KHz and is quantized using 7 bit quantizer. Find its bit rate?

- a) 48kbPs
- b) 64kbPs
- c) 16kbPs

2. Find the number of pulses, if the number of level is 128 in PCM?

- a) 6
- b) 4
- c) 7

3. Two binary values are represented by two different frequencies in :

- a) Frequency-shift-keying
- b) Phase-shift-keying
- c) Amplitude-shift-keying

4. ASK is a result of combination of Shift keying and :

- a) Analog modulation
- b) Amplitude modulation
- c) Digital modulation

5. One factor in the accuracy of a reconstructed PCM signal is the :

- a) Number of bits used for quantization
- b) Bandwidth
- c) Baud rate.

6. The modulation techniques used to convert analog signal into digital signal are:

- a) Delta modulation
- b) Pulse code modulation
- c) All of the above

7. The factors that cause quantizing error in delta modulation are

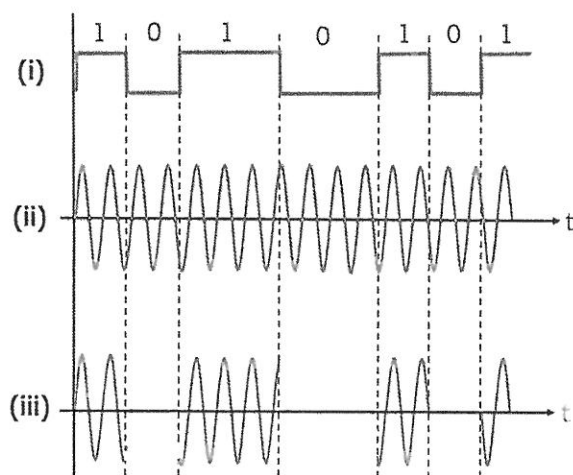
- a) Slope overload distortion
- b) Granular noise
- c) All of the above

8. In pulse code modulation system:

- a) Large bandwidth is required.
- b) Quantizing noise can be overcome by commanding.
- c) Quantizing noise can be decreasing the number of standard levels.

9. The figure below shows

- a) ASK signal
- b) PSK signal
- c) FSK signal



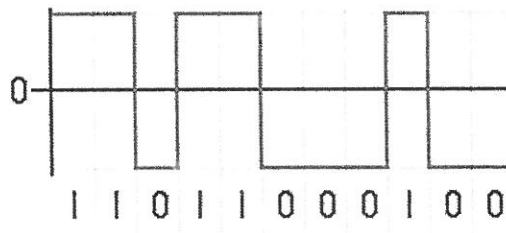
(i) = Digital bit sequence

(ii) = Carrier wave

(iii) = -----

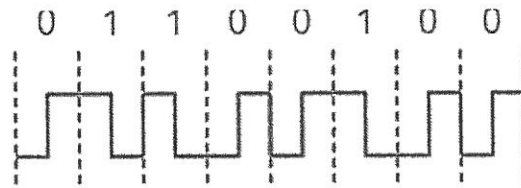
10. The figure below shows a sequence has :

- a) Unipolar NRZ signaling
- b) Bipolar NRZ signaling
- c) Manchester signaling



11. The figure below shows a sequence has

- a) Unipolar NRZ signaling
- b) Bipolar NRZ signaling
- c) Manchester signaling



12. Two analog signals $m_1(t)$ and $m_2(t)$ must be transmitted through a common channel by means of time-division multiplexing. The highest frequency of $m_1(t)$ is 3KHz, and that of $m_2(t)$ is 3.5KHz. What is the minimum value of the permissible sampling rate.

- a) 6000 samples/s
- b) 7000 samples/s.
- c) 8000 samples/s.

13. The applications of Frequency-Division Multiplexing (FDM) are:

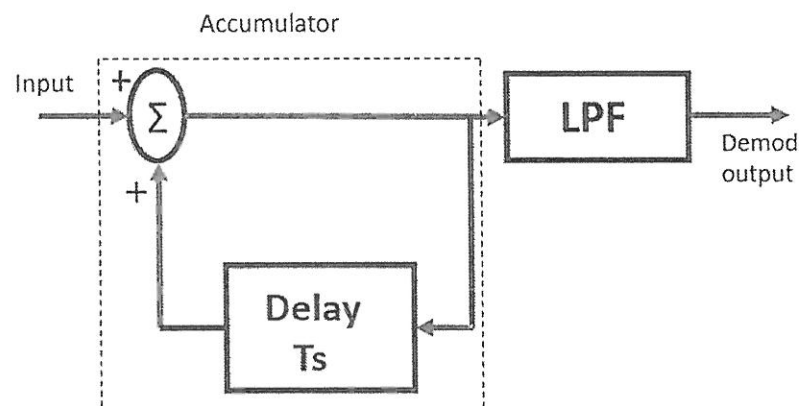
- a) AM and FM radio stations and Television broadcasting
- b) Cellular telephones
- c) All of the above

14. The Time-Division multiplexing (TDM) is a digital technique of:

- a) Encoding
- b) Decoding
- c) Multiplexing

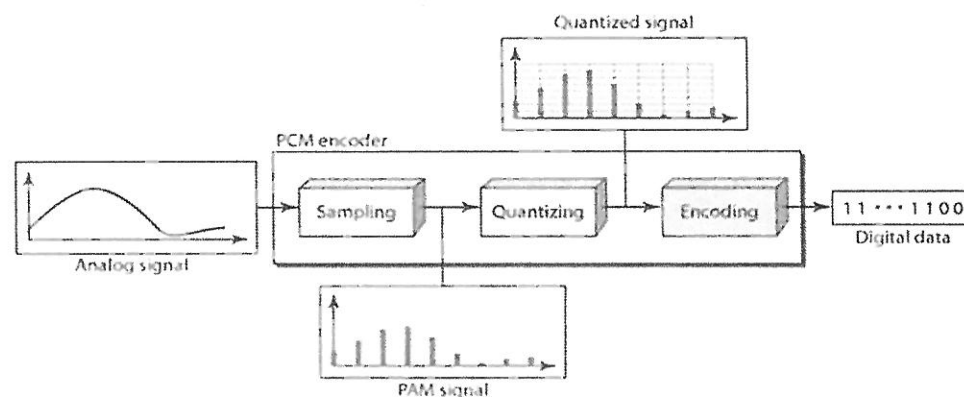
15. The name of the figure below shows the block diagram of the receiver:

- a) PCM
- b) DM
- c) QPSK



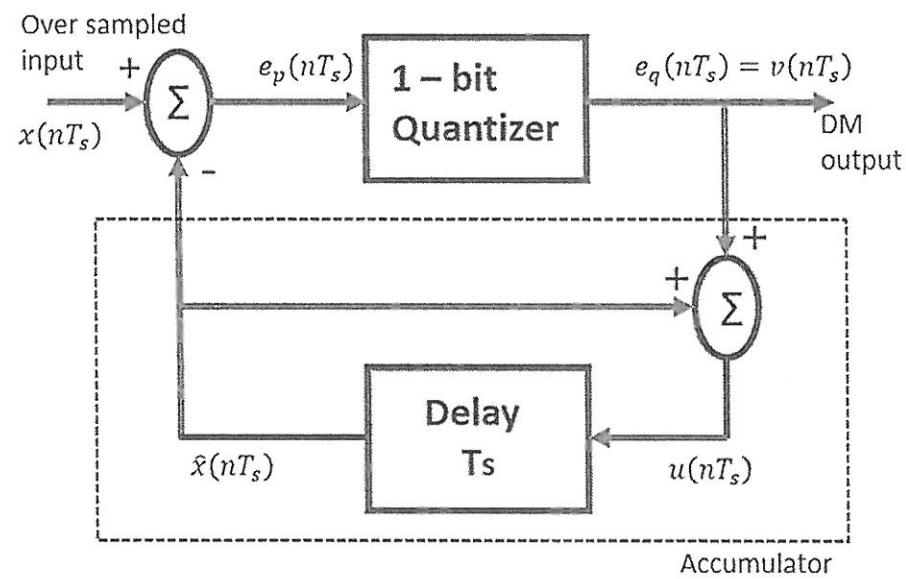
16. The name of the figure below indicates the block diagram of the emitter:

- a) PCM
- b) DM
- c) QPSK



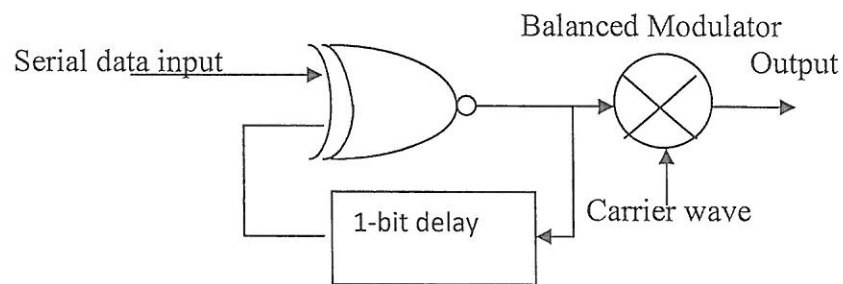
17. The name of the figure below indicates the block diagram of the emitter:

- a) DPSK
- b) DM
- c) QPSK



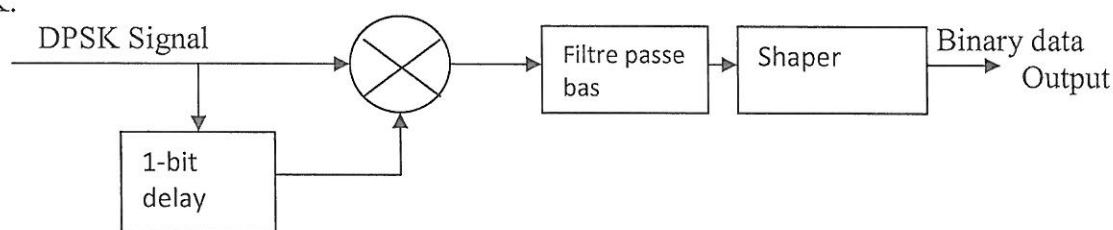
18. The name of the figure below shows the block diagram of the emitter:

- a) DPSK.
- b) DM.
- c) QPSK.



19. The name of the figure below indicates the block diagram of the receiver:

- a) ASK
- b) PSK
- c) DPSK.



20. The figure below show:

- a) QPSK signal
- b) PSK signal
- c) FSKsignal.

