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Quality Management Practices in Building Construction through Questionnaire Survey

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Abstract: ***Quality management systems are being operated in almost all sectors for products and services in the present time. In the construction sector quality control and quality assurance are of great concern for the construction project managers as the poor quality of construction results in early defects and failure of the structure this lowers the reputation of the company and leads to heavy repair costs. Further extra expenditure in achieving quality control and quality assurance is compensated by the advantages gained in the form of less maintenance, better quality and effective utilization of construction resources. There are many problems in applying the quality management effectively in construction due to its typical nature. There is a need to evaluate the effectiveness of quality management system (QMS) in construction projects. In the present work an effort is made to assess the quality management and quality assurance practices awareness and implementation among the construction personnel involved in building construction. A questionnaire containing questions related to quality control and quality assurance aspects of building construction is prepared and send to the construction personnel in Gwalior and nearby cities of Madhya Pradesh, India.***

Keywords: Quality Management, Quality Control, Quality Assurance, critical factors.

I. INTRODUCTION

A Construction Project is said to be completed successfully, when the targets of Time, Cost, and Quality are achieved. Quality management is very important aspect of construction project. Optimization in construction project can be achieved by implementing Quality Assurance and Quality Control. Quality management system includes preparing the plans of quality assurance and quality control for achieving quality. Quality Assurance document includes Inspection Test plans (ITPs) , Job Procedures (JPs) etc, for the various Construction activities . By following the guidelines provided in quality assurance document quality targets can be achieved.

The quality of construction depends upon quality of material equipments used and the quality of workmanship.

1) Mane et al (2015) studied quality management system at construction projects by means of questionnaire survey for quality control tools and quality measured on construction sites Author reported that 80% respondents very strongly believe that the check lists are Quality control tools, 90% respondents gave importance to quality of workmanship for controlling quality at construction sites.

2) Ashok kumar (2014) conducted questionnaire survey for small construction companies focussing on construction of super structure mainly; Defect in quality was identified as the critical factor which increases the cost.

3) Oyebisi (2019) found in his Questionnaire based survey that the commitment of management to achieve quality is the key for effective quality management in construction

In the present work a Questionnaire is prepared for the pre construction, during the construction and post construction stages of a construction project. The responses received from the construction personnel are analysed to identify the factors responsible for quality control during various stages of the project.

II. METHODOLOGY

A Questionnaire Consisting of total 25 Questions is prepared. there were ten questions for the pre-construction stage of the construction project related to the investigation at site , design , drawing , material procurement and safety arrangements at site , second set of questions is for execution stage of the project. There are ten questions to know about changes in design, inspection of process during construction, provision of check list to the contractor by builder, skill of labour and safety arrangements at site.

The third set of questions consists of fine questions related to various quality checks and handing over of project related document to the client. The most of the construction personnel participated in the survey are involved in construction of various types of buildings, residential and commercial. The questionnaire was sent to the participants by sending hard copy, by post and through e-mail.

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Demographic profiles of the respondent's gender wise, the age wise classification are shown in fig.1 and 2 respectively. The respondents are required to select one option from the five options for each question. The options given are 1.(Yes always), 2.(generally), 3.(most of the time), 4.(Never), 5.(Very few times).

Ten Questions were asked to assess the quality control precisions at the pre-construction stage, Only 3 Questions are selected for this paper.

1) *Question 1.* – Do you have proper procurement / store keeping arrangement?
2) *Question 2.* – Are you providing a check list / list of specification to check the quality of material?
3) *Question 3.* – Do you conduct inspection and testing of incoming materials and components as per the quality specifications?

10 questions are asked in during construction, Out of 10 questions which were asked to the survey participants following four questions are selected for their paper.

a) *Question 1.* – Are adequate inspections done for a proper workmanship at site?
b) *Question 2.* – Does the builder provide a Specified check-list to the supervisor to check proper workmanship?
c) *Question 3.* – Do you follow safety norms for labour, Suggested by the Indian Government?
d) *Question 4.* – Does the quality management system improve perception of customers towards company?

Five questions were there for the post construction stage. Following three questions are selected for this paper.

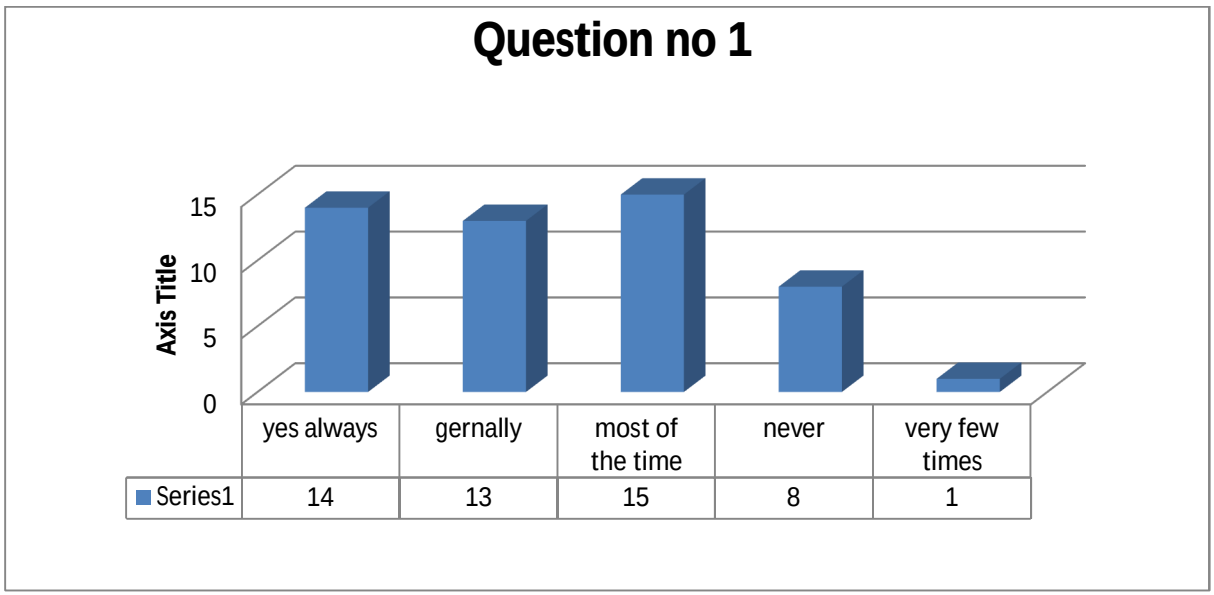
- *Question 1.* - Before the possession was carried out, have you checked all the safety measure {fire extinguisher, sprinkler, hose pipes, safety valves} were all working without any defects?
- *Question 2.* - Have you provided the quality documents to the owner / client on time of possession to ensure them for the usage of the good quality material?
- *Question 3.* - Have you cross-checked the quality of each and every component of the building just before the possession with the client, and taken it on writing to ensure everything is ok, so that in future they could not blame you?

Analysis of data collected has been mentioned in the subsequent section.

III. ANALYSIS OF DATA

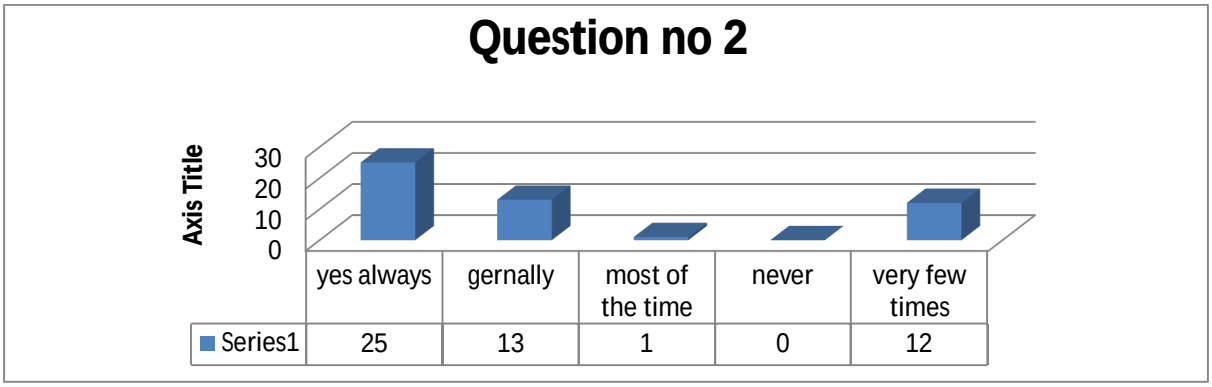
The questionnaire was send to 200 persons out of which 51 responses were received. The numbers of responses for each option of the questions are shown in the bar chart corresponding to that question.

1) *Question 1.* – Do you have proper procurement / store keeping arrangement?

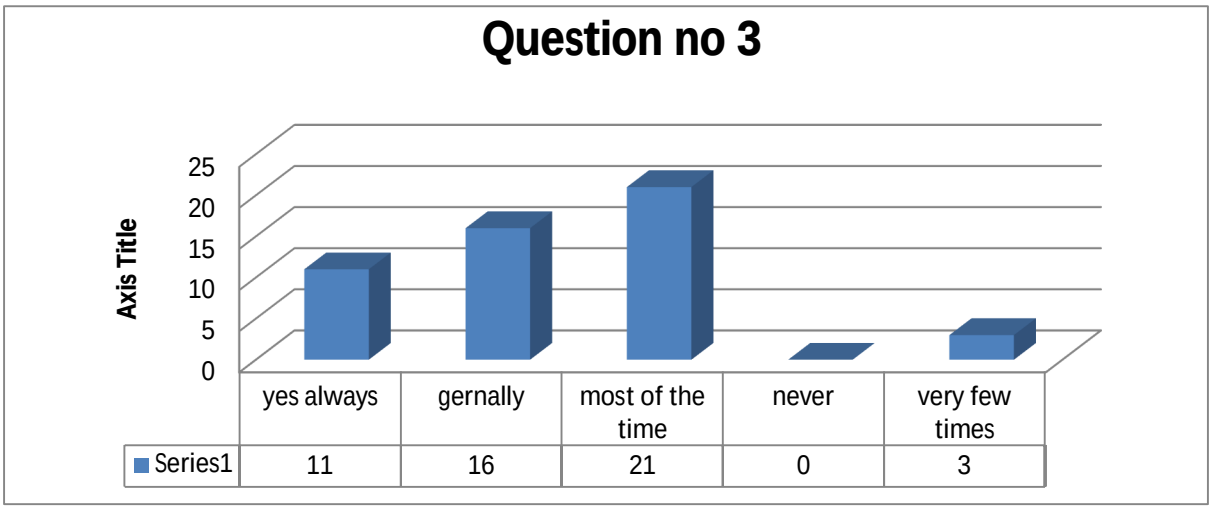


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2) *Question 2.* – Are you providing a check list / list of specification to check the quality of material?

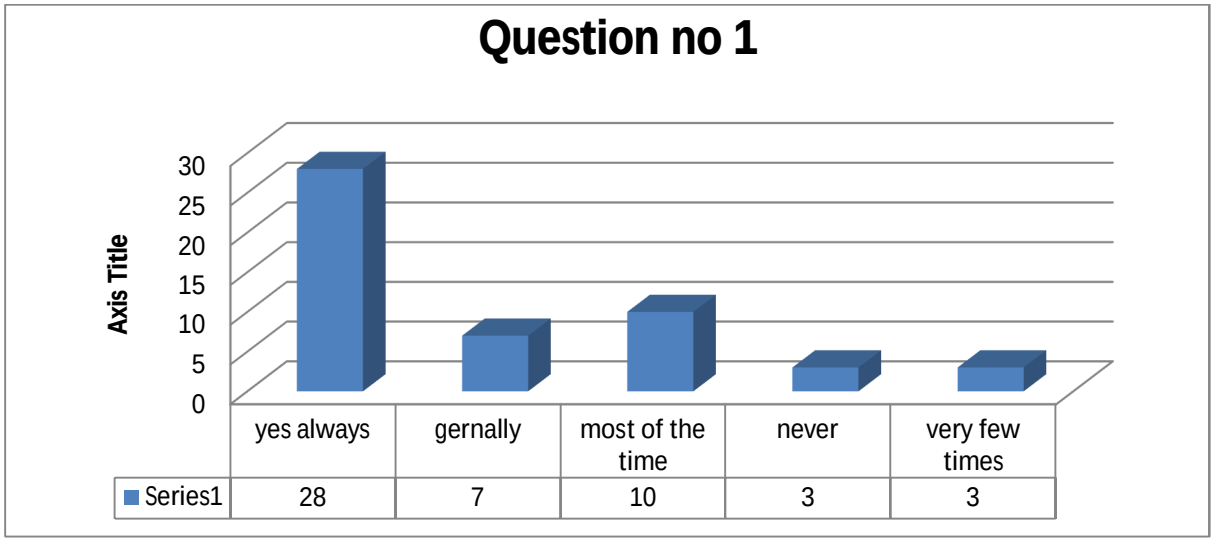


3) *Question 3.* – Do you conduct inspection and testing of incoming materials and components as per the quality specifications?



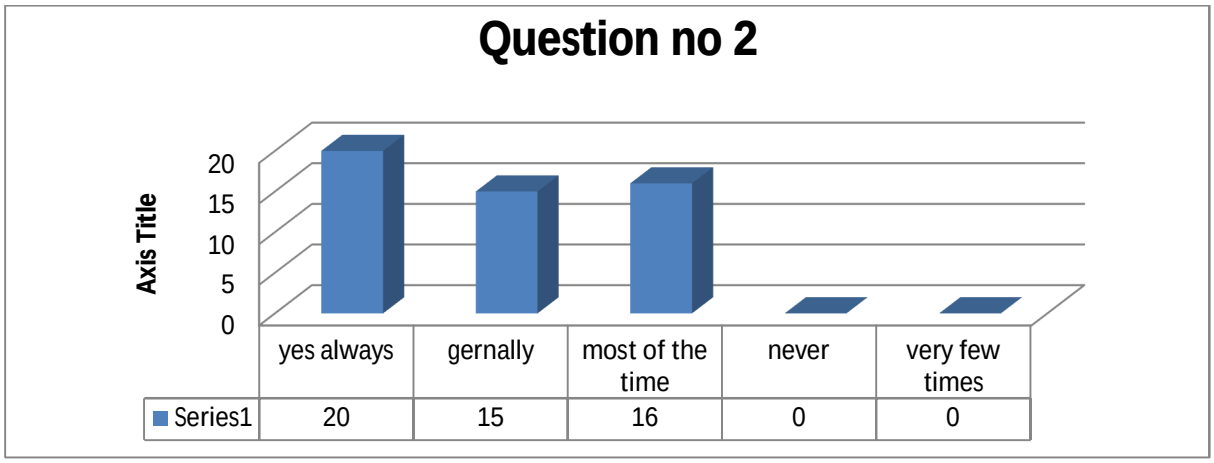
A. *During Construction*

1) *Question 1.* – Are adequate inspections done for a proper workmanship at site?

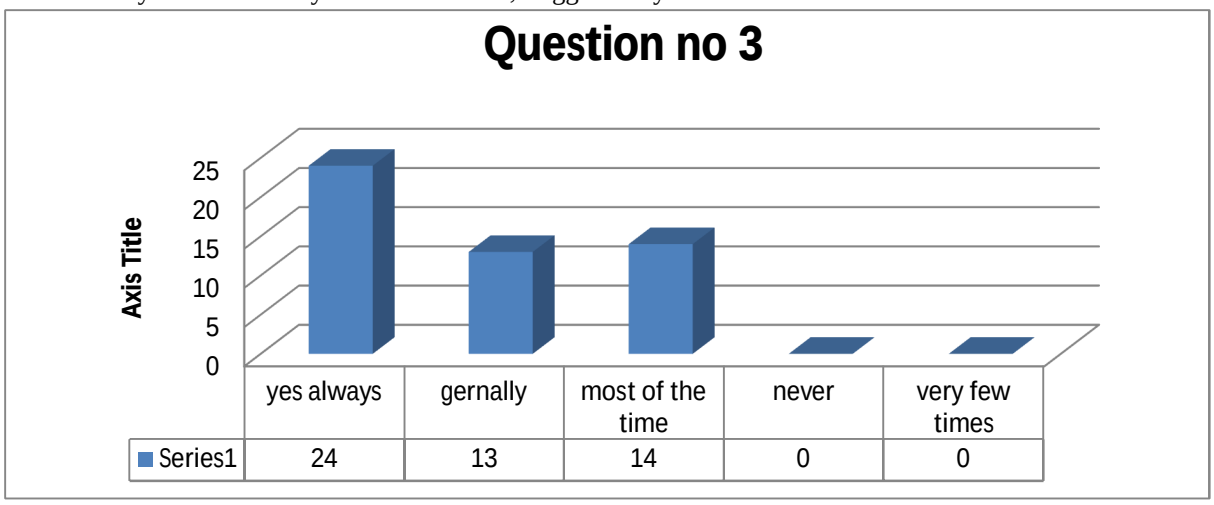


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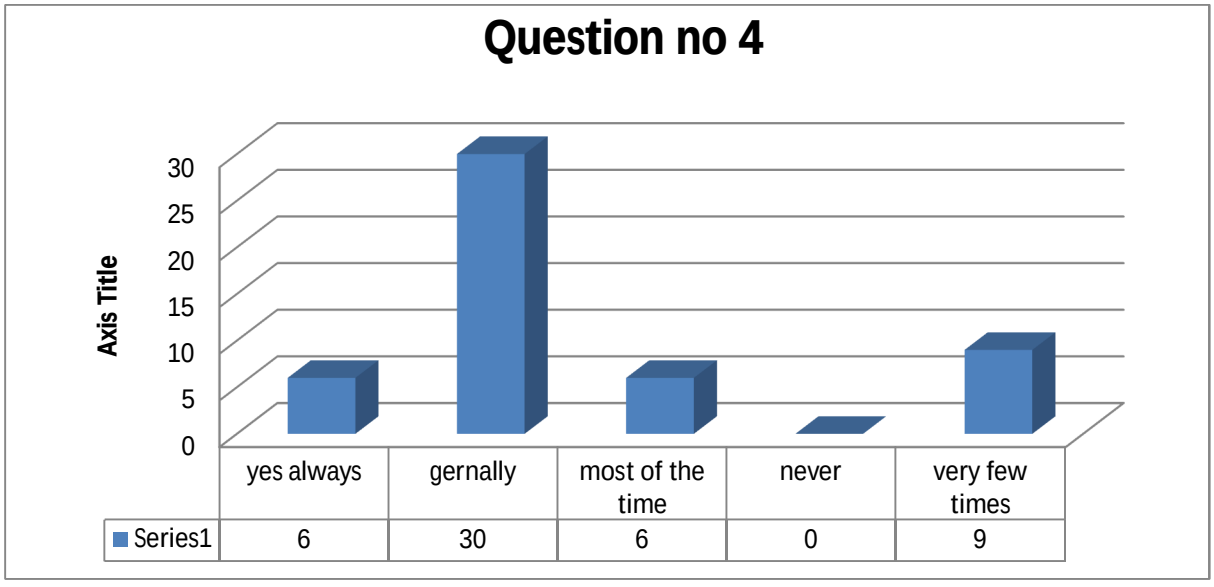
2) *Question 2.* – Does the builder provide a Specified check-list to the supervisor to check proper workmanship?



3) *Question 3.* – Do you follow safety norms for labour, Suggested by the Indian Government?



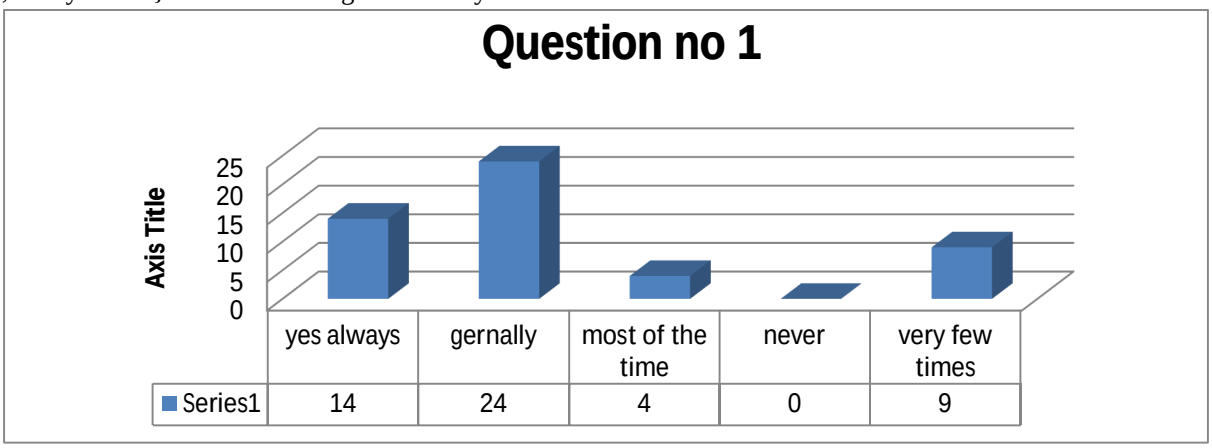
4) *Question 4.* – Does the quality management system improve perception of customers towards company?



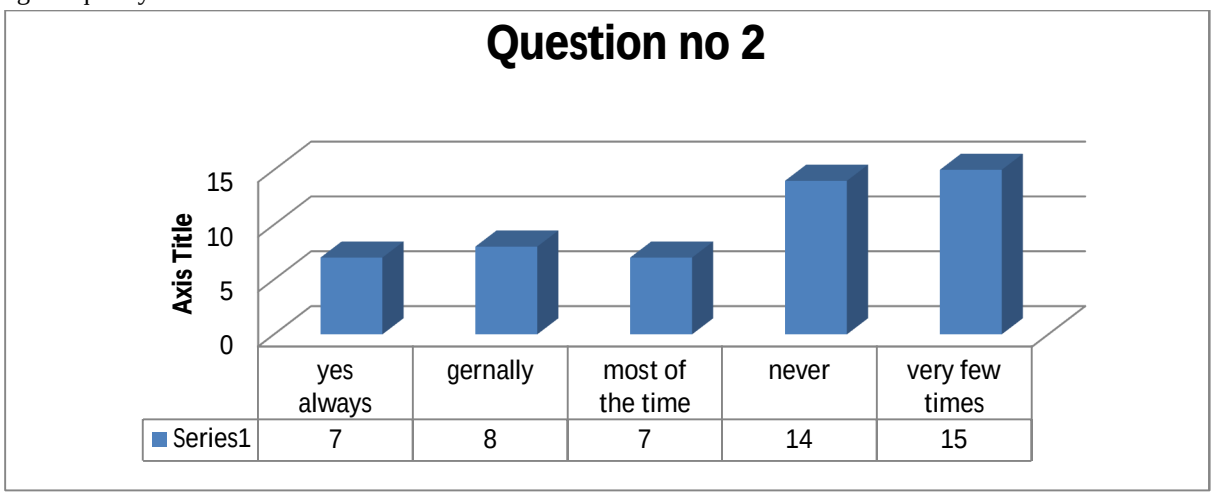
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B. Post Construction

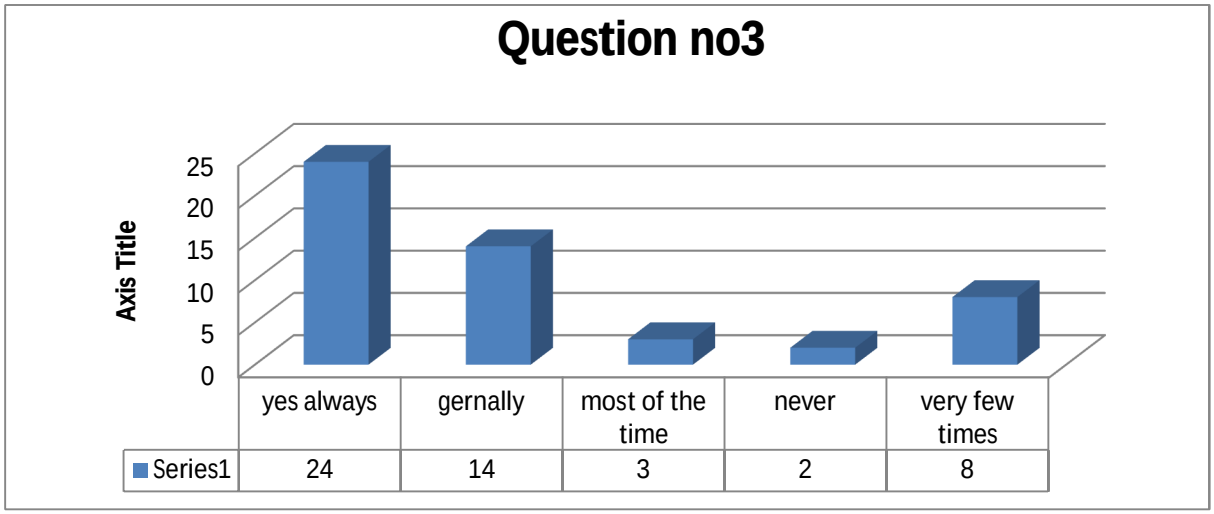
1) *Question 1.* - Before the possession was carried out, have you checked all the safety measure {fire extinguisher, sprinkler, hose pipes, safety valves} were all working without any defects?



2) *Question 2.* - Have you provided the quality documents to the owner / client on time of possession to ensure them for the usage of the good quality material?



3) *Question 3.* - Have you cross-checked the quality of each and every component of the building just before the possession with the client, and taken it on writing to ensure everything is ok, so that in future they could not blame you?



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IV. CONCLUSION

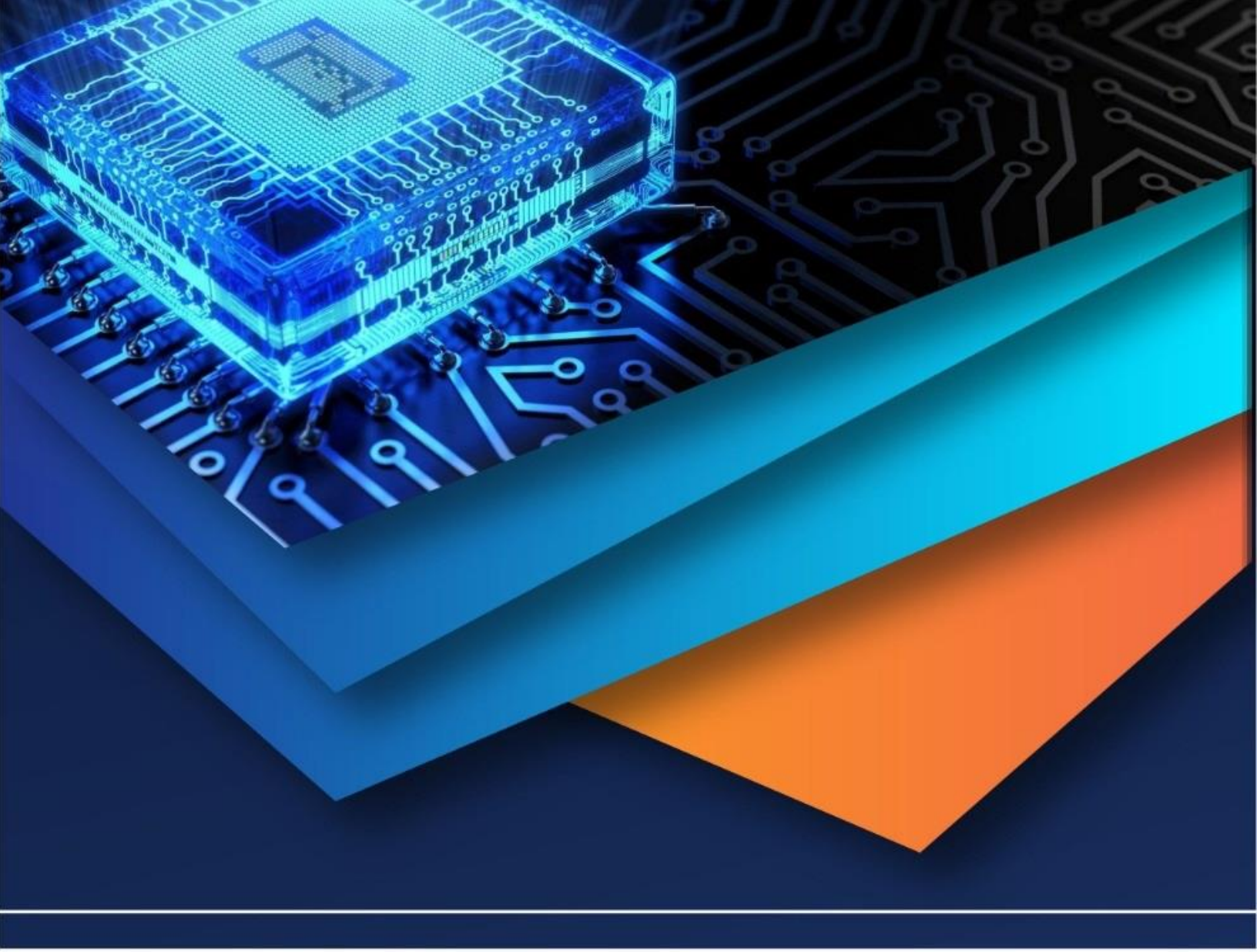
Following conclusions are drawn based on the responses received from the participants of questionnaire survey.

A. 56 % persons agreed that proper procurement / store keeping arrangement are there
B. About 75 % respondents agreed that they are providing check-list / list of specifications to check quality of material.
C. More than 90 % respondents agreed that inspection and testing of incoming materials and component is carried out.
D. About 75 % respondents agreed that during construction regular inspection for proper workmanship are carried out. All agreed that – supervisors are provided check-list for proper workmanship and safety norms for labour are followed.
E. 27 % construction personnel agreed that they do not provide quality document to the client, after construction. Only about 13% agreed that, they always provide the same to client.
F. Only 47 % always check the quality of each component of building before handing over to the clients.

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